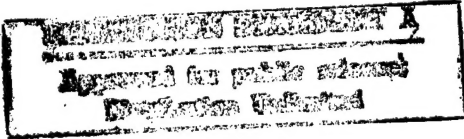



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STRESS REDUCTION FOR FAMILY MEMBERS
OF EMERGENCY ROOM PATIENTS

by

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STRESS REDUCTION FOR FAMILY MEMBERS
OF EMERGENCY ROOM PATIENTS

by

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A Dissertation Submitted to the Graduate Faculty
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Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

1998

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Dedication

My heartfelt gratitude is given to my sister, Janet Elizabeth Sellers, whose belief in me throughout this process and in life has never faltered. My deepest thanks goes to my family for their encouragement, humor, and providing respite and, also, to my dear friends for their caring support. I thank the very dedicated and skilled members of the Keesler Air Force Base Medical Center Emergency Department and the Clinical Research Laboratory who allowed this study to take place. I am grateful for the confidence held in my success by Major Dari Tritt, Lt Colonel Donald Tartasky, Major Virginia McKinley, Colonel Royetta Marconi-Dooley, Captain Cindie Newburn, Lt Colonel Veronique Carstens, Colonel Louis Rosato, Lt Colonel William Gradwell, Colonel Gary Wasem, Captain Frank Glamser, and so many other fine Air Force officers who encouraged my continued professional education.

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Chapter I

Problem Statement and Study Objectives

Medically-related stress for family members of emergency room (ER) patients is an increasing concern for many Americans. In 1996, there were more than 90 million emergency department visits nationwide (Tintinalli, Ruiz, & Krome, 1996). Research findings support the assumptions that family members may be at risk for stress associated with exposure to traumatic incidents (Meichenbaum, 1994) and for stress associated with patients' conditions and the required medical procedures (Burish & Lyles, 1983; Dahlquist, Gil, Armstrong, Ginsberg, & Jones, 1985; Jay & Elliott, 1990; Lichtman, Taylor, Wood, Bluning, Dosik, & Leibowitz, 1984). Treating medically-related stressors for family members of critically ill or injured patients presents several important challenges for the ER social worker.

The present study focused on social work in the emergency room in a U.S. Air Force medical center in Biloxi, MS. Generalizing from the Air Force medical system to the civilian health care sector must be done with caution as the populations served by military and civilian hospitals may be different. Eligibility for military medical services falls under specific guidelines that may influence the age groups of populations served by a military emergency department. Even within the Air Force medical system, emergency services and populations served may vary depending on the overseas,

stateside, or remote stateside location of a base, or the size of a medical center, a hospital, or a clinic.

Consumers of military medical care reflect the characteristics of the military and retiree population. Typically, active duty military members and their families are in a younger age range and are generally in good health. "In general, military personnel on active duty are young, healthy, and married...over 64% of the active military force are age 30 or younger" (Garber & McNelis, 1995, p. 1727). Large numbers of older military retirees and their spouses may also use military medical facilities and emergency service departments. "Although most of the population served by military social workers are active-duty service members and their families, social work practice may also include military retirees and their eligible family members..." (p. 1726). Military personnel and their family members who use medical care may be from diverse cultural and ethnic backgrounds and national origins. Approximately 32.6% of enlisted personnel and 13.1% of the officer corps are people of color (p. 1728). Approximately 10.6% of the total active-duty force is composed of women (p. 1726).

The psychosocial concerns presented at a military hospital may be different from those presented in an inner city hospital or even in a rural hospital. Impacting active duty members and their families are the unique attributes of the military family lifestyle: 1) mobility, 2) separation, 3) periodic absence of parents, 4) adjustment of children, 5) overseas living, 6) high-stress and high-risk jobs, 7) conflicts between the needs of the military family and those of the military system, and 8) authoritarian

management requirements (Whitworth, 1984). Garber and McNelis (1995) note that military families will probably experience these factors during their affiliation with the armed forces. Based on the unique characteristics of the active duty and retired military population and their eligible family members, it is important to investigate medically-related stress for family members within the context of the specific population served and the military system.

The provision of social work in military health care reflects one of the seven fields of practice generally considered to constitute the profession of social work: child and family, occupational, health, mental health, aging, education, and corrections (Compton, 1983). Within the context of the Air Force, social workers have traditionally remained under the division of mental health in Air Force hospitals. Currently, four Air Force medical centers have departments of social work that include discharge planning, medical social work, and family advocacy (Garber & McNelis, 1995, p. 1734). Air Force social workers provide on-call support to the emergency room for mental health issues, social work services, family maltreatment incidents, substance abuse services, and critical incident stress debriefings. Medical social work may be available in larger facilities; however, social workers are not commonly assigned to the emergency room to support family members of critically ill or injured persons. This study is a first step toward identifying medically-related stress in families in the active duty and retired military population, those persons who may benefit from social work support in the

military emergency room, and for describing and evaluating the efficacy of treatments for this specific population.

Emergency medical care is a specialty field with dynamic capabilities for saving lives and detecting medical problems that require continued critical attention. To illuminate the magnitude of health problems, consider three major causes of death in the U.S.: cardiovascular disease, cancer, and stroke. The American Heart Association noted, "Cardiovascular disease alone accounts for nearly one million deaths each year in the United States, while 6.3 million Americans are estimated to have significant coronary disease (Chandra & Hazinski, 1994, p. 1-1). Stroke is the third leading cause of death, ranking behind heart attack and all forms of cancer. Nearly 2,980,000 Americans now alive have been stroke victims" (p. 5-1).

Furthermore, exposure to the event requiring treatment for a patient can also impact family members and significant others. Meichenbaum (1994) reported, "In the U. S. approximately 150,000 people die of sudden, untimely, traumatic accidental deaths each year and the impact of such losses on family members appears to be long term" (p. 28). Family members may have been at the scene of the accident, disaster, or crime causing the patients' acute injuries.

Relatives accompanying a patient to the ER may have witnessed or responded to the recurring or unexpected symptoms of a severe illness. A patient's emergent and chronic health issues can impact kinship and social networks by inducing stress (Berkman & Volland, 1997; Chavez, 1987; Motler & Captain, 1979). Families may be experiencing other types of stressors at the time of a patient's hospital

entry, which may further exacerbate their condition. Norris (1990) indicated a need for thorough assessments of trauma patients and their families. Norris's (1994) epidemiological study of trauma documented more sources of stress and trauma impacting family members than was previously realized. ER social workers support medical care by providing biopsychosocial assessments, integrated views of persons in their social environments (Berkman & Volland, 1997), and recognition of compounded stressors that may impact patient recoveries and family members' resources.

In a summation, hospital emergency departments are points of entry to medical care for chronic and unpredictable health problems and can also serve as primary prevention resources for patients' family members. Knowledge of disease processes and injuries, assessing family members' exposure to trauma, and recognizing compounded family stressors are important aspects of social work in the ER. The purview of the ER social worker includes approaches to treat stress that support the mental and physical health of the patients' families. For lowered stress, effective task management, and the reduced likelihood of stress reaction illnesses, the functioning of the patients' family members must be addressed.

These concerns mirror the chief issues for social workers in all areas of health care practice: 1) providing biopsychosocial care, 2) using primary prevention approaches, 3) developing screening tools for social health care factors, and 4) recognizing the significant role of the family in a patient's health care (Berkman & Volland, 1997).

Current research on emergency room social work practice and Crisis Intervention as a primary prevention approach is scant (Ell, 1997). Early research on Crisis Intervention has been associated with some measurement difficulties (Kolotkin & Johnson, 1983). The literature on social work in the ER provides descriptions of counseling and grief work (Von Bloch, 1996; Wells, 1993), Crisis Intervention (Groner, 1978; Silverman, 1986), debriefing programs (Spitzer & Neeley, 1992), and disaster management (Krell, 1978). However, a deficiency of outcome studies regarding the implementation of these approaches is noted. Without research and data, ER social workers are hindered in choosing the most effective approaches for diverse client populations. The identification of interventions most likely to result in successful outcomes is not available.

ER social workers have experienced concerns parallel to those of the medical community with financial and administrative management of patients and have documented the successful results of their practices (Boyack & Bucknum, 1991; Keehn, Roglitz, & Bowden, 1994; Ponto & Berg, 1992). However, empirical research on scientifically-based social work practice with family members of emergency room patients is noticeably absent in the literature.

Numerous descriptive articles in the literature on social work in ER and trauma units provide case histories of family members and a process of responses to traumatic events (Epperson, 1977; Epperson-SeBour, 1990; Silverman, 1986). The majority of the ER social work literature identified that dual emotional and cognitive tasks face the patient's family members. Commonly outlined are vignettes of

the psychological responses of relatives and significant others, who wait to learn the patient's disposition and the treatment options. However, the use of clinical measurements for stress and anxiety by social workers in the ER are noticeably absent in the literature.

Complex psychosocial demands exist for family members, (viz., variability may be present in the attending family members' experiences with life-threatening illnesses or traumatic accidents, crucial decisions must be made on the patient's behalf, and family members are needed to provide support to the patient during hospitalization and after discharge from the hospital). In these situations responding to a family member's stress reactions in support of task completion is a significant aspect of ER social work. How is social worker intervention to be guided without client-specific assessment or scientifically-validated intervention techniques?

Many descriptive studies focus on social work roles, functions, and phases of management for patients and families in the emergency room, yet there are few scientifically-based studies in the literature providing empirical evidence of effective treatment approaches for health-related stressors in the military hospital emergency room. This study proposed an intervention technique, provided a comparison to the standard social work intervention, and identified those persons who may benefit from its application.

Study Objectives

The purpose of this study was to identify systematically client characteristics, delineate the effectiveness of two

interventions, and differentiate outcomes on physiological and psychological measures for family members of emergency room patients in an Air Force medical center. First, research is provided on Crisis Intervention, a standard, primary prevention approach used by social workers, and Cognitive-Behavioral and Applied Relaxation techniques, a combination that has proven effective in behavioral medicine. Second, a comparison of treatment outcomes was made regarding the characteristics of the family members served. The principal objective of the present study was to assist practitioners with useful assessment and measurement techniques and effective treatment approaches for different family members in the emergency room setting. It was desired that any knowledge derived from this study would increase social work knowledge related to the biopsychosocial aspects of family members and significant others responding to medically-related stressors. Physiological and psychological stress responses of family members, who are confronted with life-threatening illnesses and injuries to patients, are frequently evidenced in the emergency room environment. Yet, such common occurrences may be taken for granted, may not receive attention from staff, or may not be identified by the family members themselves as significant for treatment. Physiological and psychological responses to medically-related stressors can be measured and treated by ER social workers.

The research questions for this study are introduced in later sections. Chapter II provides a review and critique of the relevant literature pertaining to social work in the

emergency room, physiological and psychological measurements, and approaches to treatment.

Chapter II

Literature Review

This chapter reviews the literature on the history of social work in civilian and military medical settings, social work in the specialized setting of the emergency room, the standard procedure for social work intervention, Crisis Intervention, and an experimental intervention -- Cognitive-Behavioral and Applied Relaxation. Some of the physiological components of stress, specifically, the cardiovascular system; the coordinated and interrelated nervous system and endocrine system; the impact of stress on these systems; and the biological gender differences in these systems are discussed.

History of Social Work in Civilian and Military Medical Settings

Traditionally, social work has focused on services to families. The American public has entrusted care of the sick and the poor to social work case management since the 19th century (Brennan & Kaplan, 1993). In 1905 medical social work services were established at Massachusetts General Hospital and gave "an enlarged understanding of any psychic or social conditions which may cause the patient distress of mind or body" (Cannon, 1996, p. 98). Over time social work services expanded in various medical settings. Golan (1972) presented one of the first frameworks addressing the emotional condition of the family members of ER patients and proposed the need for social work intervention.

The history of social work in the military can be traced to the Civil War with the development of the U. S. Sanitary Commission, whose mission was disease prevention and provision of a general system of relief (Bevilacqua & Darnauer, 1977; Torgerson, 1956). Traditionally, social work in the military has been part of mental health services. However, a current focus of the "military is developing innovative family support policies, programs, and services. Its leadership now understands the importance of the family to the accomplishment of the military mission. . . Many health care and social services delivery systems have been created since the 1960s in an attempt to address the needs of service members and their families" (Garber & McNelis, 1997, p. 1728). The focus of this research is the assessment and treatment of family members who accompany patients to military hospital emergency rooms and are experiencing stress in response to critical illnesses and injuries.

The Specialized Setting of the Hospital Emergency Room

Social work in the setting of the hospital emergency room developed concomitantly to the history of emergency and trauma care in American hospitals. In the decades of the 1900s, lessons learned from military casualty care were applied in U.S. hospitals, creating improvements in emergency care to patients. Hospital emergency departments and trauma care evolved nationwide, initiated by the Highway Safety Traffic Act of 1966 and the Emergency Act of 1973 (Neff & Kidd, 1993; Tintinalli et al., 1996). The focus of these government mandated acts was to systematize throughout the United States medical care for seriously injured persons and decrease mortality and disabilities from injuries

(Epperson-SeBour, 1990). The literature on social work in the emergency room reflects an interrelated process with the evolution of emergency medical care, trauma care centers, and disaster management programs (Epperson-SeBour, 1990; Spitzer & Neeley, 1992). Contributions to the literature on ER social work are discussed in this chapter. However, social work in military emergency rooms is a specialized and limited area of military social work practice and its study is noticeably absent in the literature.

Berkman and Volland (1997) delineated the following major concerns of social work in current health care practice: 1) measured outcomes of practice intervention, 2) evaluation of intervention effectiveness, 3) proof of efficacy by an evaluative process based on clinical practice guidelines (Shueman & Troy, 1994), and 4) assessing the influences of social supports on patient recuperation and family support on successful patient integration to the community (Caroff & Mailick, 1985). Examples of empirically-based social work practice in the ER responding to these major concerns of social work in health care practice are noticeably absent from the literature. Social work in the ER has shared the financial and administrative concerns of medical care in the U.S. (Boyack & Bucknum, 1991; Keehn et al., 1994; Ponto & Berg, 1992); however, these studies include outcome measures that tend to focus on administrative rather than practice issues.

A review of the literature of social work in the ER provides an overview of social work entry into a specialized health care area. A trend in the literature from the successive decades, 1970s, 1980s, and 1990s, indicates a

dichotomy of topics. Articles focus on either program typologies that include social work roles, functions, patient groups, and interventions or focus on a second area that includes administrative and management functions. On the whole, the articles are descriptive in nature with limited statistical analysis and provide a scant number of surveys, outcome studies, or research studies on program effectiveness.

Contributions to the ER Social Work Literature in the 1970s

Early articles described specific social work roles in the ER (Bennett, 1973; Bergman, 1976; Strinsky, 1970). Also noted in the literature were treatment and service delivery protocols for victims of large scale disasters (Krell, 1978). Epperson (1977) described a crisis phase for families based on observations of 230 families of multiple trauma victims. Treatment protocols introduced by Groner (1978) targeted patients and families in cases of death, rape, child abuse, and suicide attempts, plus, recognizing interventions to reduce stress and pressures affecting staff. Lindenberg (1972) and Golan (1972) promoted crisis intervention as a treatment approach. Several authors, Kassell (1975), Grumet and Trachtman (1976), and Spitz (1976), proposed a clinical approach for mental health patients in the ER.

Issues for program models were cited in the literature, namely, managerial concerns (Farber, 1978) and staff coverage (Krell, 1976). Farber (1978) identified that schools of social work did not offer emergency room social work as a graduate specialty and proposed a model based on services implemented at a major teaching hospital.

Descriptive statistics for referrals and presenting problems were shown for a two-year period.

Contributions to the ER Social Work Literature in the 1980s

The trend of descriptive social work articles continued in literature of the 1980s. Moonilal (1982) presented a psychosocial approach for treatment of trauma patients and families. Silverman (1986) detailed role-behaviors and tasks in a five-phase crisis intervention model. The literature identified changing social work roles in the ER (Clement & Klingbeil, 1981) and medical staff perceptions of patients who could benefit from social work intervention (Dove, Schneider, & Gitelson, 1985). Present in the literature were descriptive articles on specific at-risk populations, for example, child maltreatment (Fujimoto & Kerson, 1989), spouse maltreatment (McLeer & Anwar, 1989), psychiatric problems (Healy, 1981), and elderly clients in the ER environment (Shepard, Maye, & Ryback, 1987; Wilson, Simson, Duncan, & Lloyd, 1982).

Soskis (1980) focused on problem resolution in a large, urban hospital emergency room setting and multipurpose roles of social workers. Weinbach (1980) described survey results from rural hospital social workers that ranked ER social work functions. An advocacy role for service access was suggested as a social work function. Sample size, response rates, and statistical analysis were not reported for the survey.

Contributions to the ER Social Work Literature in the 1990s

Characteristic of the literature of the 1990s was the dichotomy of patient-focused or administratively-focused articles and the sparse number of empirically-based practice

articles. During the 1990s ER social work intervention for trauma occurred on a larger scale. Hegggar (1993) presented psychosocial intervention for community trauma from motor vehicle deaths and injuries in an emergency/trauma department protocol. Spitzer and Neeley (1992) proposed a model program for a statewide disaster team that implemented critical incident stress debriefings, while Epperson-SeBour (1990) elaborated social work roles, functions, and treatment approaches in a trauma-care system. Clinical treatment for individuals, families, and groups responding to grief and loss from critical illness was outlined by Wells (1993) and Von Bloch (1996). Several authors described social work practice in the ER with the following at risk populations: psychiatric patients (Leff-Simon, Slaikeu, & Hansen, 1990); patients with acquired immune deficiency syndrome (Furstenberg & Olson, 1990); and patients with Alzheimer's (Berman & Rappaport, 1990).

Reflected in the literature of the 1990s was an emphasis on program effectiveness, cost effectiveness, minimizing resource depletion, benefits/costs, and management obstacles. Ponto and Berg (1992) examined an urban hospital's analysis of the costs and benefits of social work services in an emergency department on a 24-hour, seven-day-a-week basis. The assessment used the output value index, which is the estimated value of the program's output contrasted with the estimated investment of resources to maintain the program. The program was operated at a marginal cost to the hospital and may have created value in tangible and intangible benefits.

A Canadian program confirmed the effectiveness of social work in the emergency department in two areas: 1) reducing non-acute admissions, and 2) providing continuity of care for patients at high social risk. Results after four months indicated that 11.6 percent of all emergency room patients were assessed by social workers, and 24 non-acute admissions were deferred (Boyack & Bucknum, 1991, p. 55).

An outcome study focused on minimizing hospital resource depletion from recidivism and nonmedical complaints. The social workers' use of a pro-active intervention strategy, rather than a support-oriented intervention produced the greatest decline in the main outcome measure: recidivism (Keehn et al., 1994).

Crisis Intervention: The Standard Procedure for ER Social Work

A standard, primary prevention approach to treatment by social workers in the Emergency Room is Crisis Intervention (CI). The following are presented: the historical development, a conceptual framework, assumptions, and active ingredients of CI. A review of literature and rationale for use of CI in this study is noted.

Historical Development of Crisis Intervention

The theoretical orientation and methods of CI were developed mid-century. Initially CI was formulated in response to a disastrous fire (Lindeman, 1944). Two decades later, CI was described as a generic crisis approach that involved techniques helpful in resolving specific crises (Jacobson, Strickler, & Morely, 1968). CI has presented a mental health response to public need for readily available, short-term treatments (Butcher & Maudal, 1976). Theoretical

and practice applications have vastly expanded and overlapped (Streigel-Moore, 1990). CI is currently classified as a brief psychotherapy (Ewing, 1990; Koss & Shiang, 1994; Parad & Parad, 1990).

Conceptual Framework

Two important concepts of CI are the definition of crisis and its process, called the crisis sequence. A crisis is characterized as "a temporary state of upset and disorganization, characterized by an individual's inability to cope with a particular situation using customary methods of problem solving, and by the potential for a radically positive or negative outcome" (Slaikeu, 1990, p.15). Crisis sequence involves a specific, identifiable stressful precipitating event. The perception of the event is meaningful and threatening. A response of disorganization or disequilibrium results from the stressful event and the coping or interventive tasks involved in resolution may be adaptive or maladaptive (Parad & Parad, 1990).

Ewing (1990) delineated seven underlying general principles of CI: 1) is readily available and brief; 2) deals with families and social networks; 3) addresses no single definition of crisis, but a wide range of human problems; 4) focuses on present problems; 5) aims to resolve the present problem and to relieve symptoms, but to help clients develop adaptive ways of coping with future problems and crises; 6) is reality oriented; and 7) requires psychotherapists to assume nontraditional roles.

Crisis Intervention and Social Work with Families.

Slaikeu (1990) placed CI within the framework of the general systems theory, emphasizing its application to the family

system. Later Ell (1997) identified CI as a primary social work intervention, which blends ego and cognitive psychology and individual stress theories. The author noted the feature of CI that provided distinction from psychological brief treatment is the extent to which intervention focuses on individual or family coping breakdowns due to a specific, triggering event.

Crisis Intervention and Social Work in the Emergency Room. The term, CI, is often used to describe a full venue of resources and interventions in an ER or trauma setting (Epperson, 1977; Epperson-Sebour, 1990; Groner, 1978; Leff-Simon et al., 1990). Silverman (1986, p. 312) specified the main goal of CI as an intervention in the ER is to "identify and reinforce the strengths and coping skills of a patient's family." This adaptation specified a treatment model of role-behaviors and tasks (Moonlial, 1982; Silverman, 1986). The four phases generally include 1) listening to families' details of the trauma and securing appropriate medical information, 2) continuing assessment of family dynamics and coping ability to guide intervention, combined with a brief family history, 3) dealing with the families' reactions, and 4) preparing the family to see the patient.

Assumptions. Several authors who have written extensively on CI, Butcher and Maudal (1976), Kolotkin and Johnson (1983), and Parad and Parad (1990), have noted the theoretical pioneers of CI are Erich Lindemann, Gerald Caplan, and Donald Klein. These writers conceptualized crisis, the crisis sequence, the use of time limits, plus, applied CI principles in community mental health centers and examined practice applications.

The following are the underlying assumptions of the crisis intervention model (Golan, 1987; Parad & Parad, 1990; Slaikeu, 1990). These assumptions are abbreviated, but characterize a process:

- 1) Either situational stress or hazardous life events can evoke social disorganization or acute emotional disequilibrium for people.
- 2) Acute situational stress is not necessarily pathological, but generally a normative life experience. Reactions vary based on the meaning of the event for the individual.
- 3) Regaining emotional balance is a natural endeavor after disequilibrium.
- 4) Psychological vulnerability accompanies the struggle for emotional equilibrium.
- 5) While vulnerable, individuals are also amenable to psychological intervention.
- 6) No matter the type of stressful event, the stages of crisis reactions are universally common.
- 7) Outcomes to crises can be either growth producing or negative.

Silverman's (1986) application of role-behaviors and tasks with family members in the emergency room setting meets the underlying assumptions of CI.

Active Ingredients. The active ingredients of Silverman's (1986) application are role-behaviors and tasks focused on identifying the family dynamics, strengths, and coping abilities of family members. Significant to this study are the following ingredients: 1) participants relay a history of the precipitating event, 2) persons provide brief family and health histories, 3) identification of coping

skills used in past experiences, 4) participants list their own personal sources of strength, and identify family supports and social networks, 5) preparation for meeting the patient in the ER environment, and 6) referrals are made to appropriate community resources.

Efficacy of Crisis Intervention Approach

Few scientifically-based studies of CI with family members of critically ill or injured patients in the ER were present in the literature. Parad and Houston (1984) studied the role of the social worker in an inner city emergency department to expand the knowledge base of contemporary crisis intervention. CI was identified as the intervention employed with highest priority for family members after accidents, catastrophic illness, and other critical incidents. No outcome measures were identified. Epperson-Sebour (1990) reported outcome studies on particular areas of the trauma center were forthcoming. From a review of CI outcome studies, Kolotkin and Johnson (1983) reported that of clients treated with crisis intervention, existing outcome data indicated a measured improvement in 70% to 80% of clients. The authors noted that when considering only the best designed studies on CI, measured improvement was reduced to 60% to 70% of clients treated.

Determining the effectiveness of CI by empirically-based studies leaves more questions than answers. Ell (1997) provides an overview of the literature on crisis intervention by identifying studies adapting CI methods to human service agencies, noting the transferable nature of the intervention through guidelines produced for other professions encountering clients in crisis, and tracing

research studies of the past decades. In Ell's article regarding the need for outcome research on CI, concerns from several authors were noted 1) examination of the immediate and later effects of CI (Viney, Clarke, Bunn, & Benjamin, 1985); 2) assessment of CI with socioculturally diverse populations (Bromley, 1987; Weiss & Parish, 1989); 3) exploring the efficacy of individual, family, and environmental CI for populations experiencing different types of crises; and 4) research studies using various CI methodologies to compare outcomes (Eggert, Friedman, & Zimmer, 1990; Nelson, Landsman, & Deutelbaum, 1990).

One example of an empirically-based study on CI is that of Viney et al. (1985), who evaluated the long and short term effects of crisis intervention counseling with 285 randomly selected surgery patients. Participants were randomly assigned to a crisis-intervention treatment and no-counseling treatment. Two-thirds of the participants were female. CI sessions lasted from 30 to 45 minutes and occurred on admission and discharge. Upon hospital discharge, counseled patients were less anxious and less passive in frustration-related anger than patients without counseling; however, on follow-up, the only long term effect was for reduced anxiety.

Few current outcome studies exist regarding the efficacy of CI. Most studies were conducted in the 1980s (Ewing, 1990). Kolotkin and Johnson (1983) identified 1) varied definitions for the term, crisis intervention; 2) measurement difficulties for research on CI, such as, high numbers of different assessment instruments, traditional outcome assessment measures, and unstandardized

client satisfaction measures; and 3) problems of control and methodology that make the interpretation of findings extremely difficult.

Rationale

This study proposed that the disequilibrium of individuals in crisis situations could be assessed, measured, and treated. CI is considered as an intervention for study based on the facile adaptation of the model to the environment of the hospital emergency room. The following applications of CI in the ER parallel the underlying principles of CI. ER social workers could readily provide brief CI intervention for families and significant others who accompany ER patients. Health-related family stress is but one of many human problems, which can be identified as a crisis. CI in the ER would be reality oriented, provide a focus on immediate problems, aim to relieve symptoms, and help family members develop adaptive ways of coping with future problems and crises. The ER social worker would assume a nontraditional role from that of a traditional clinical social worker.

Cognitive-Behavioral Techniques Applied in the ER Setting

Cognitive-Behavioral (CB) interventions have a unique origin growing from two theoretical perspectives. CB has been successfully applied to several areas of behavioral medicine. Presented are the historical development, conceptual framework, assumptions, active ingredients, review of literature, and its rationale for this study.

Historical Development

The historical development and differences in cognitive and cognitive-behavioral approaches are clarified by Hollon

and Beck (1994). Dynamically trained theorists developed cognitive treatments. These interventions emphasized the role of meanings (beliefs) and strategies were implemented to examine the rationality or validity of beliefs.

Cognitive-behavioral theory and treatments were developed by theorists who were trained as behaviorists. The primary focus of CB theorists was the development of strategies for teaching cognitive skills. In a CB approach thinking is conceptualized more concretely. Interventions were developed to influence covert self-statements (private behaviors). CB theorists proposed that the interventions acted similarly to laws of conditioning to affect overt behaviors. In a CB treatment approach individuals are taught specific cognitive skills to examine and modify self-statements for mastering problems (Hollon & Beck, 1994, p. 429). Cognitive and cognitive-behavioral interventions are generally integrated into treatment approaches.

Conceptual Framework

Numerous theorists have contributed to the conceptual framework of cognitive-behavioral therapy. Kendall (1991) and Kendall and Panichelli-Mindel (1995) asserted that cognitive-behavioral treatment employs a combination of performance based and cognitive techniques to affect changes in cognition, emotions and behavior. The focus of CB treatment is the way people respond to their personal cognitive interpretations of their experiences rather than the environment, the experience itself, or the relationship of thoughts and behaviors. Changing distorted or deficient information processing and building a person's adaptive ways to process the world are the key elements.

Dryden and Scott (1991) proposed that the traditional therapist characteristics of empathy, warmth, and genuineness are necessary, but not sufficient conditions for client change. Faulty thought patterns are held to play a major role in emotional disorders; therefore, cognition and behavior are primary areas for client change.

Meichenbaum (1985) designed a coping skill's program to reduce and prevent stress. Stress Inoculation Training (SIT) defined stress as the interaction between the individual and the environment. Persons were taught adaptive self-statements and ways to respond to difficult situations (Meichenbaum & Deffenbacher, 1988; Meichenbaum & Fitzpatrick, 1993).

Assumptions. In an early analysis of CB, Mahoney (1974, 1979) placed cognitive-behavioral theory in an operational definition that remains valid in its specificity by stating how the model, "explains human functioning as the product of reciprocal interaction between personal and environmental variables, and provides a rationale for differentially altering cognitive, behavior, affect, and interpersonal and social situations" (Berlin, 1983, pp. 1096-1097). The following are assumptions underlying cognitive-behavioral interventions:

- 1) Change occurs from the efforts to examine the accuracy of existing beliefs (Beck, Rush, Shaw, & Emery, 1979).
- 2) By modifying underlying propensities (attribution) subsequent risk can be prevented, and the disconfirmation of negative expectations should mediate the resolution of distress (treatment) (Abramson, Metalsky, & Alloy, 1989; Hollon & Garber, 1980).

- 3) Cognitive changes can mediate changes in emotional states (DeRubeis, Evans, Holon, Garvey, Grove, & Tuason, 1990; Rush, Kovacs, Beck, Weissenburger, & Hollon, 1981).
- 4) Cognitive activity affects behavior (Dobson & Block, 1988).
- 5) Cognitive activity may be monitored and altered (Dobson & Block, 1988).
- 6) Desired behavior change may be affected through cognitive change (Dobson & Block, 1988).

Active Ingredients. In cognitive-behavioral treatment, persons are taught to identify and examine the distortions and irrational beliefs in their thinking. Examples of specific distortions were categorized by Burns (1980). The following are cognitive distortions that may impact information processed about interactions and the environment: all or nothing thinking, catastrophizing, overgeneralization, mindreading, a mental filter, automatic self-discounting, jumping to conclusions, magnification or minimization, emotional reasoning, moralizing, labeling, and personalization. By recognizing the difficulties these distortions can cause, persons can make changes in their thinking which can influence behavior and feelings.

Effective Cognitive Behavioral Interventions

Primary prevention in the area of behavioral medicine is the context of this research; therefore, the following literature review will examine studies that have used cognitive-behavioral interventions and applied relaxation techniques. Currently cognitive-behavioral approaches are used by clinical social workers, psychologists, psychiatrists, and psychiatric nurses to treat a variety of

problems and disorders. CB interventions and applied relaxation techniques in behavioral medicine are not abundant in the literature. Specifically reviewed are studies using CB and applied relaxation as an intervention for noxious medical procedures, treatment of tension headaches, immune functions, cancer, and Human Immune Deficiency Virus-1.

Noxious Medical Procedures. Ludwick-Rosenthal and Neufeld (1988) provided a brief compendium evaluating outcome studies for noxious medical procedures. One early study by Kaplan, Atkins, and Lenhard (1982) used a factorial design to study cognitive-behavioral modification with self-instruction training and relaxation techniques taught to 35 female and 33 male patients undergoing a medical procedure, a sigmoidoscopy to examine the anal cavity. A negative consequence of this procedure is perforation of the soft tissues. The use of cognitive-behavioral techniques to help patients manage the stress of the sigmoidoscopy was supported by the study results. Compared to the control group, participants who received relaxation training rated themselves as less anxious [$F(1/62) = 4.10, p < 0.05$], had fewer body movements during the exam [$F < 1.0$], and emitted fewer verbalizations than those in the control group [$F(1/60) = 4.03, p < 0.05$] (p. 77).

Alleviation from distress with painful, invasive medical procedures is noted in the three following studies. Kendall, Williams, Pechacek, Graham, Shisslak, and Herzoff (1979) used CB techniques for relaxation and reduction of anxiety in the process of being a better adjusted patient for cardiac catheterization procedures. Study participants

included 44 adult male veterans between 39 to 77 years of age who were randomly assigned to one of four conditions--two experimental groups and two control groups. CB proved to be the superior intervention to the control conditions. CB interventions had the highest ratings of adjustment and the lowest post-catheterization levels of anxiety [$\bar{x}(10) = 6.67$, $p < .01$] of all the conditions (p. 55).

A study by Jay and Elliott (1990) indicated the efficacy of Cognitive-Behavioral and Applied Relaxation for 72 parents of children undergoing treatment for pediatric leukemia. The parents who were randomly assigned to a stress inoculation group reported lower state anxiety, " $M = 3.13$ versus $M = 39.0$, $F(1,54) = 14.42$, $p < .001$; lower trait anxiety, $M = 37.3$ versus $M = 40.7$, $F(1,54) = 5.47$, $p < .05$; and higher positive self-statement scores, $M = 50.5$ versus $M = 45.6$, $F(1,54) = 4.53$, $p < .05$ " (p. 802) than parents assigned to the child-focused intervention group.

Getka and Glass (1992) found patients were better able to cope with dental procedures with Cognitive-Behavioral techniques to reduce stress.

Headache Disorders. Blanchard (1992) provided a historical review of the psychological treatment of benign headache disorders. The author noted that as early as 1938 relaxation training, specifically progressive muscle relaxation, has been tested for alleviation of tension headaches. A recent study used the active ingredients, progressive muscle relaxation (PMR) and cognitive therapy, to treat sixty-six tension headache patients. The combination was found to be superior to control conditions, 61.5% versus 31.6% (p. 215). Cognitive treatment and PMR had

an advantage over PMR alone. The level of headache medication consumption decreased significantly for the active treatment groups (Blanchard, Appelbaum, Radnitz, Michultka, Morrill, Kirsch, Hillhouse, Evans, Guarnieri, Attanasio, Andrasik, Jaccard, & Dentinger, 1990).

Immune Functioning. Ader, Felten, and Cohen (1991) documented studies of humans and animals that indicate stress can lower and can continue regulating lowered immune function. Cognitive-Behavioral interventions and relaxation are among many procedures for enhancing immunity within the context of stressors. In a brief compilation of psychoneuroimmunology research, Kiecolt-Glaser and Glaser (1992) reported a study that included progressive relaxation training and social contact for 45 older adult members of independent living facilities. Participants in the relaxation condition showed improved immune function (Kiecolt-Glaser, Glaser, Williger, Stout, Messick, Sheppard, Ricker, Romisher, Briner, Bonnell, & Donnerberg, 1985).

Cancer. The use of Cognitive-Behavioral techniques and Applied Relaxation are also noted in studies of serious illnesses, namely, cancer. Early studies of specific coping skills using progressive muscle relaxation and systematic desensitization to ameliorate adjustment to the disruption of cancer include: Burish and Lyles (1981 & 1983), Lyles, Burish, Krozley, and Oldham (1982), Morrow and Morrell (1982), and Telch and Telch (1986).

Relaxation was one of several stress management interventions used in a structured group for 35 patients with malignant melanoma. Results indicated reduced psychological distress and significant immunological changes

for the intervention group compared to the control group (Fawzy, Kemeny, Fawzy, Elashoff, Morton, Cousins, & Fahey, 1990). For children undergoing bone marrow aspirations and lumbar puncture, an adaptation of cognitive-behavioral intervention was effective for alleviating distress (Jay, Elliott, Katz, & Siegel, 1987). A similar adaptation of cognitive-behavioral intervention was useful for decreasing nausea and distress for three children undergoing cancer chemotherapy. Reductions of 46% to 86% from baseline levels of observed behavioral distress from venopunctures were noted during intervention (Dahlquist, Gil, Armstrong, Ginsberg, & Jones, 1985, p. 325).

HIV. Antoni, Baggett, Ironson, LaPerriere, August, Klimas, Schneiderman, and Fletcher (1991) studied 47 HIV-1 asymptomatic healthy gay men. Among the treatments applications were a cognitive-behavioral stress management condition. Decreases in antibody titers to two latent herpesviruses, Epstein Barr Virus and Human Herpesvirus Type 6, were found for the cognitive-behavioral stress management condition. Results suggested that greater relaxation practice and greater willingness to comply with intervention were associated with greater change.

Perry, Fishman, Jacobsberg, Young, and Frances (1991) examined 307 physically asymptomatic participants who volunteered for serological testing for HIV-1. The Stress Prevention training (SPT), based on Cognitive-Behavioral treatment, was provided for one of the treatment groups and was found to reduce psychological distress in the participants [$t(99) = 2.62$, $p < .01$] (p. 146).

Rationale

The five salient features of Cognitive Behavioral treatment outlined by Dryden and Scott(1991): brevity, highly structured, widely applicable, relatively easily learned, and relatively effective, lent to the applicability of CB as an intervention for management of stress and trauma in the emergency room.

In a summary of Cognitive-Behavioral approaches, Rosenblatt and Waldfogel's, The Handbook of Clinical Social Work (1983, pp. 1095-1096), noted three general, practice guidelines extracted from research (Meyer, 1972; Reid, 1978, Reid & Epstein, 1972; Wood, 1978). A practitioner would: 1) analyze the problem broadly, including multiple social and psychological causal influences, 2) define client goals narrowly, in simple language, and 3) use a strategy to reduce the problem, so the worker and client can counteract the major areas of the problem. The use of CB treatment fits into these guidelines. An assumption of this research proposal is that treatment approaches used with family members or significant others would meet these practice guidelines.

The Physiological and Psychological Components for Measurement and Assessment

The following section reviews current physiological literature regarding stress, the related responses of the nervous and endocrine systems, and heart rate and blood pressure. Studies on cortisol and its relation to psychological and physiological stress are presented. Biological differences for males and females, specifically cardiovascular physiology, are discussed.

The Relationship Between the Nervous and Endocrine Systems and Stress

Memmler, Cohen, and Wood (1996, p. 186) delineate physiological systems that mediate stress. The two primary controlling and coordinating systems of the human body are the nervous system and the endocrine system. These systems have different functions, yet are closely related. The nervous system controls rapid activities, such as, muscle movement and intestinal activity via electrical and chemical stimuli. The glands of the endocrine system influence pervasive effects, more slowly and longer, via chemical messengers, or hormones. The nervous system controls the pituitary gland, which is the regulator of the other endocrine glands. Thus, the functioning of the endocrine system adjusts to the demands of a dynamic, external environment by the connections with the nervous system.

Endocrine Glands. The following section will further describe the interconnectedness of the endocrine system, specific glands, their secretions and functions as a background for understanding the hormone, cortisol, and its relationships with the nervous system, the vascular system, and stress.

The endocrine glands are located throughout the body. These glands are ductless and secrete hormones into the blood through capillary action (Scanlon & Sanders, 1997, p. 191). Memmler et al. (1996, p. 186) discuss how hormones travel in the blood and tissue fluids to all parts of the body, acting on specific target tissues to provide regulatory effects for metabolism, growth, and other processes.

The principal chemical categories of hormones are amino acid compounds and steroids. Normally, hormonal amounts are secreted within a specific range. Negative feedback to the glands regulates the secretion levels. Therefore, if the endocrine gland has over secreted its hormone, and exerted more effect on the target tissue, there is a negative feedback effect on the endocrine gland which decreases its secretory action. The release of hormones generally has a rhythmic pattern. Hormones of the adrenal cortex follow a 24-hour cycle related to a person's sleeping pattern. The level of secretion is greatest before arising and least at bedtime (Memmler et al., 1996, p. 186).

Adrenal Glands. The adrenal glands, located above the kidneys, are composed of an inner area, the medulla, and an outer area, the cortex. These parts act as separate glands. When stress creates changes in the internal physical environment, the nervous systems' sensory receptors are stimulated, acting on the hypothalamus, sending sympathetic impulses to the various tissues and the adrenal medulla, creating the hormonal secretions of the catecholamines, epinephrine and norepinephrine (Kirkpatrick, 1992, p. 474). The hormones produced by the adrenal cortex are steroids, derived from the cholesterol molecule. Currently forty steroids have been isolated from the human adrenal cortex and of these aldosterone and cortisol are produced in the greatest quantity and are functionally the most important (p. 475).

Adrenal Medulla, Catecholamines, and the Stress Response. In response to stimulation by the sympathetic nervous system, the adrenal medulla releases two chemically

related hormones, adrenaline or epinephrine, and, noradrenaline or norepinephrine, which act as neurotransmitters (Memmler et al., 1996, p. 191). The effects provided by epinephrine and norepinephrine, also called catecholamines, (Scanlon & Sanders, 1997, pp. 187-188) support preservation through the following physical stress reactions:

- 1) Norepinephrine causes vasoconstriction in skin, viscera, and skeletal muscles. Muscles contract and blood pressure rises.
- 2) Epinephrine increases heart rate and force of contraction
- 3) Epinephrine causes bronchioles to dilate by relaxation of the smooth muscle of their walls. Breathing rates increase with the dilation of air passages.
- 4) Epinephrine causes peristalsis to decrease.
- 5) Epinephrine causes glycogen stored in the liver to be converted to glucose. Glucose flowing in the blood provides the voluntary muscles sustenance for extraordinary work output. Blood glycerol and fatty acids increase for energy.
- 6) Epinephrine causes vasodilation in skeletal muscles, vasoconstriction in skin and viscera, and increases the rate of cell respiration.

Adrenal Cortex and the Glucocorticoids. Among the hormones produced by the adrenal cortex are the glucocorticoids. Three hormonal functions provided are 1) maintenance of the body's carbohydrate reserve by controlling the conversion of amino acids into sugar instead of protein, 2) abundant production during stress to support the body's response to adverse conditions, and 3) suppression of the inflammatory response. Cortisol or

hydrocortisone, is a major glucocorticoid (Memmler et al., 1996, pp. 191-192). Cortisol is secreted in plasma, urine, and saliva (Vinson & Hinson, 1992, pp. 71-86).

Stress and Hormones

Stressful events trigger specific physiological responses that involve the nervous system and the endocrine system. The flight or fight response of the central nervous system is mediated by the hypothalamus and the autonomic nervous system (Memmler et al., 1996, p. 196).

The hypothalamus acts on the pituitary gland to release adrenocorticotrophic hormones (ACTH). Within three minutes of administration of ACTH to the adrenal cortex, the serum cortisol concentration increases. Only a small amount of cortisol is stored in the adrenal gland, so serum concentration increases by hormone production. Morning levels of serum cortisol vary between eight and 25 Ug./dl, with an approximate 50% decrease by late afternoon. Circadian rhythm, established after infants begin sleeping through the night, also influences cortisol concentration. The serum cortisol concentration rises in response to physical or emotional stress (Sperelakis & Banks, 1996, pp. 592-593).

Protective Functions of Cortisol. Cortisol or hydrocortisone protects the functioning of the brain during stressful events in the following manner. The brain is unable to produce its own glucose. Cortisol increases the use of fats and excess amino acids for energy and decreases the use of glucose by body cells. The "glucose-sparing effect" conserves glucose for use by the brain. Cortisol enables other cells to use alternative energy sources,

ensuring whatever glucose is present will be available to the brain (Scanlon & Sanders, 1997, p. 188). Secretions of the adrenal cortex protect the body by 1) raising blood sugar, 2) inhibiting inflammation, 3) decreasing immune response, and 4) limiting histamine release. The glucocorticoids and catecholamines function to preserve the body, but if unregulated these substances may be harmful to the body, causing stress related disorders (Memmler et al., 1996, p. 196).

Literature Review of Salivary Cortisol Studies and Psychological Variables

Since the 1970s attention has been given to medical and psychological research on salivary cortisol. Luthold, Marcondes, and Wajchenber (1985) found that in healthy subjects, the circadian rhythm in salivary cortisol paralleled that in plasma. Also, for some samples of cortisol concentrations, salivary cortisol measurement was advantageous over plasma cortisol determination. Vining, McGinley, Maksvytis, and Ho (1983) found that for the clinical assessment of adrenocortical function, the appropriate measure is a saliva sample, as it is simple, stress-free, and non-invasive, as opposed to a serum cortisol sample. Laudat, Cerdas, Fournier, Guiban, Guilhaume, and Luton (1987) noted salivary collection was easily performed, could be repeated readily, and was determined the best indicator of adrenal glucocorticoid activity, as it represented the biologically active form of the circulating hormone. The concentration of cortisol in saliva is practically independent of alterations of its transport protein, corticosteroid binding globulin. In 1993

research on Cushing's disease by Bonnin, Villabona, Rivera, Guillen, Sagarra, Soler, and Navarro (1993) reiterated the use of basal salivary cortisol as a good index to study adrenal function, as salivary cortisol can detect rapid changes in stimulation or repression test results.

When evaluating the hypothalamic-pituitary-adrenal function, the researchers, Kahn, Maxwell, and Barron (1984), discovered that the relative change in cortisol levels from the basal value is greater in saliva than in plasma. Kiess, Meidert, Dressendorfer, Schriever, Kessler, Klonig, Schwartz, and Strasburger (1995) identified cortisol levels were age dependent and no gender differences were found. These studies laid the groundwork for cortisol use in testing the stress response for psychological testing in human trials.

Curtis, Nesse, Buxton, and Lippman (1978) and Vernikos-Danellis and Heybach (1980) recognized that samples of cortisol, increasing during stress, could be collected for measurement and assessment. The following studies have examined the relationships between psychological variables, phobias and occupational stressors, and the hormone, cortisol.

Curtis et al. (1978) examined plasma cortisol at the circadian cycle of adrenal cortical function by evoking anxiety in six patients via the technique of flooding. Results showed increases in plasma cortisol above control levels in some of the subjects. However, the participants' self-rated anxiety levels did not account for differences in the participants' cortisol responses. The findings suggested

further evaluation of affective arousal as the key psychological determinant of adrenal cortical function.

Neese, Curtis, Thyer, McCann, Huber-Smith, and Knopf (1985) examined plasma cortisol production (among other endocrine and physiologic responses) during in vivo exposure therapy for 10 phobic women. Participants' anxiety responses were intense and consistent. Cortisol responses appeared to be impacted by time of day, as cortisol levels were greater for subjects tested in the evening hours than in the morning hours. Time of day did not affect the other variables tested. In all, response patterns to stressors were more complex and variable than expected.

Undberg, Melin, Fredrikson, Tuomisto, and Frankenhaeuser (1990) compared neuroendocrine measurements, urinary catecholamines and cortisol, under laboratory and naturalistic conditions. One focus of the study was to examine the consistency in cortisol excretion induced by a series of frequently used stress tests in a controlled laboratory experiment and real-life stress on a normal work day. Cortisol excretion was determined by radioimmunoassay. Neuroendocrine responses to stress in the laboratory indicated cortisol excretion rates were significantly higher during laboratory-induced stress compared to rest. The results suggested low generalizeability of neuroendocrine reactivity from laboratory stress to real-life stress; however, absolute levels of cortisol excretion showed consistency over conditions and time.

This study proposed to assess changing levels of salivary cortisol related to the interventions with the comparison and experimental group participants.

The Relationship Between the Cardiovascular System and Stress

The following section has been simplified to provide a physiological illustration of blood pressure and pulse, their measurements, and the influence of adrenal hormones during stress in an extremely complex organism, the human body.

Blood Pressure. The force of the blood against the walls of the blood vessels is called blood pressure. Normal blood pressure is essential to life and therefore is a frequently measured vital sign. Blood pressure is created by the pumping of the ventricles of the heart and is estimated in units of mmHG or millimeters of mercury. For systemic blood pressure readings two numbers are obtained: systolic and diastolic. When the left ventricle is contracted, the blood pressure is higher and the reading is called the systolic pressure. When the left ventricle is relaxed, blood pressure is lower and the reading is called the diastolic pressure. The brachial artery of the arm is most often used for blood pressure readings. Here a normal systolic range is 90 to 135 mmHg, while a normal diastolic range is 60 to 85mmHg. The farther from the heart blood flows, the lower the blood pressure reading (Scanlon & Sanders, 1997, p. 239).

Blood Pressure Measurement. The sphygmomanometer, an instrument consisting of an inextensible cuff and an inflatable bag, is generally used to estimate blood pressure. The cuff is wrapped around the arm above the elbow, and the inflatable bag, lies between the cuff and the

skin, positioned over the brachial artery of the arm. Pressure in the bag is raised to a value exceeding the patient's arterial systolic pressure. The brachial artery is squeezed. Pressure is then released from the inflatable bag. When inflation pressure falls below the arterial systolic pressure, small spurts of blood pass through the artery each time the arterial pressure exceeds the cuff pressure. Systolic pressure is the first sound detected. As the inflation pressure approaches the diastolic pressure, the blood spurting sounds disappear (Berne & Levy, 1996, pp. 298-299).

Pulse and its Measurement. Ventricular contraction in the heart begins a wave of increasing pressure that travels along the arteries. This wave or pulse can be felt in arteries close to the body surface, particularly if vessels are pressed against a bone. The pulse is most commonly taken at the radial artery of the wrist. Some factors influencing the pulse include the following: 1) pulse is faster in small persons than large persons, 2) pulse is usually slightly faster in women than men, 3) muscular activity influences pulse rate, and 4) emotional disturbances may increase pulse rate (Memmler et al., 1996, p. 253)

Hormonal Influences. Hormones play a part in the maintenance of systemic blood pressure remaining within normal limits. Hormones act on the blood vessels, speed the heart, constrict blood vessels in the skin and viscera, and dilate vessels in the muscles (Kirkpatrick, 1992, p. 282)

Circulatory Adjustments to Stress. The body experiences many external environmental phenomena as stress, e.g., heat and cold, and compensates through a

thermoregulatory system. Circulatory adjustments are also made to injury and stress. Shock, the most serious condition, occurs when blood returns to the heart decreases and cardiac output falls. Falling blood pressure produces a rapid thready pulse, skin vasoconstriction, and cold extremities that appear pale and blue. The cause of shock is the massive outpouring of catecholamines with activation of the sympathetic nervous system. Shock can lead to some decreases in cardiac contraction, output, blood perfusion to the heart muscles, lowered blood pressure, and cardiac impairment. The replacement of fluid and restoration of cardiac output become priorities for treatment of shock (Kirkpatrick, 1992, p. 305).

Overfield's Review of Biological Variation in Psychological and Physiological Stress

"Sex differences are a relatively unexplored field . . . the mechanisms that explain the sex differences, at all ages, in mortality and morbidity are not understood, nor is much known about how and why the sexes respond differently to environmental, physical, and psychological stress." (Overfield, 1995, p. 182). The author is one of few current authors examining biological differences in the sexes. The following section examines the biological differences in the physiological measures which are proposed for study (i.e., blood pressure and heart rate). While epinephrine is mentioned by the author, cortisol is not noted.

Overfield (1995, p. 170) outlined the following different reactions to physiological and psychological stress by females and males: 1) Males' blood pressure increases more than that of females (Light, Turner,

Hinderliter, & Sherwood, 1993; McAdoo, Weinberger, Miller, Fineberg, & Grim, 1990); 2) During stress the pulse rates of females increases more than that of males (Stoney, Davis, & Matthews, 1987); 3) Increased epinephrine levels are more common during stressful events for males than females (Baron, Petschnig, Bachl, Smekal, & Kastner, 1992; Brooks, Hevill, Meleagros, Lakomy, Hall, Bloom, & Williams, 1990; Del Rio, Carani, Bonati, Marrama, & Della Casta, 1992; Diamond, Jones, Caprio, Hallarman, Diamond, Addabbo, Tamborlane, & Sherwin, 1993; Frankenhaeuser, Dunne, & Lundberg, 1976); 4) Women respond to stress in a physiologically more economic way than men (Frankenhaeuser, Rauste von Wright, Collins, von Wright, Sedval, & Swahn, 1978).

Overfield (1995, p. 176) reported on the following different cardiovascular parameters between males and females: 1) Females have smaller hearts than males (Huchinson, Cureton, Outz, & Wilson, 1991; Keul, Stockhausen, Pokan, Huonker, & Berg, 1991); 2) at rest and in response to exercise, women have higher heart rates (Gillum, 1988; Gillum, 1991; Janosi, Varaljai, & Nikodemusz, 1987); and 3) women and men have different blood pressure responses to exercise (Gleim, Stachenfeld, Coplan, & Nicholas, 1991; Holewijn, Heus, & Wammes, 1992).

This study does not focus on research specifically differentiating stress responses of men and women; however, the unique factors associated with gender are taken into account for examining trends or patterns of physiological responses by participants in the study.

Chapter III

Conceptual Framework

This chapter provides the conceptual framework and assumptions underlying the research conducted for this study. The main purpose of this study was to implement scientifically-based research to determine the extent of successful outcome measures for the reduction of stress for the family members of critically ill or injured emergency room patients. The conceptual framework presented herein includes contextual variables, (i.e., antecedent health care problems and the more constant contextual variables of the military setting). Also delineated are the dependent variables and the treatment variables. From a thorough review of the literature regarding the standard social work intervention and other interventions applied to the problems of stress, crisis, or trauma management, two theories and their respective treatment methods were chosen for this research-- Crisis Intervention (CI) and Cognitive-Behavioral Theory.

Chapter III reviews assumptions regarding the suitability of treatment approaches in the ER setting; a critical analysis of the two interventive theories selected; a comparison of the outcomes of the critical analysis to determine which theory might provide the most favorable outcome; and the creation of a treatment approach to best address the reduction of stress. Later in this chapter, the

research hypotheses, operationalization, and instrumentation are discussed.

Contextual Variables

Precipitating Event

The precipitating event is the antecedent of medically-related stress for a family member. In this study a precipitating event is defined as the critical illness or injury that results from trauma, sudden onset of illness, or a chronic health care problem that requires an skilled, ongoing, and specialized health care monitoring and treatment by physicians and nurses. This research study provides specificity regarding the level of medical treatment a patient requires for his or her presenting health care problem. Eligible study participants are exclusively family members or significant others of patients who require admission to either the intensive care unit, the cardiac care unit, the medical/surgical unit, the pediatric care, or the 23 hour observation unit at Keesler Medical Center, Keesler AFB, MS.

The Assumption of Stress

An assumption is made that medically-related stress would occur for family members of critically ill or injured patients in the ER. Stress reactions in ER environments are noted in the social work literature (Epperson, 1977; Epperson-SeBour, 1990; Silverman, 1986; Von Bloch, 1996; Wells, 1993). Also, medically-related stress for family members, patients, and nurses has been documented and studied in the Intensive Care Unit environment (Chavez & Faber, 1987; Cochran & Gangong, 1989; Holmes-Garrett, 1990; Rukholm, Bailey, Coutu-Wakulczyk, & Bailey, 1991). However,

consideration is provided that medically-related stress might not occur for family members. A parallel is given to the epidemiological data about Post Traumatic Stress Disorder (PTSD). "Exposure to trauma is a necessary, but insufficient cause of PTSD. The presence of a PTSD following a traumatic event is the exception rather than the rule" (Meichenbaum, 1994, p. 23).

Military and Military Health Care as Contextual Variables

The setting for this research is an Air Force medical center. Some aspects of the military medical environment will be different from those of a civilian setting. The overall environmental context of the military includes both the overarching military organization and the military culture (Garber & McNelis, 1995; Knox & Price, 1998). The impact of the military organization and the unique factors associated with military lifestyle are major considerations for military family support policies, programs, and services. Quality of life for military families is tied to personnel retention issues (Military Family Resource Center, 1977). Military leadership recognizes the importance of the family for the accomplishment of the military mission, thus health care and social services have been implemented to meet the needs of service members and their families (Garber & McNelis, 1995). Military health care may be viewed differently by its military consumers regarding perceptions about health care, the role of the medical professionals and structure of the settings, and the protocols that are followed in the health care settings.

Security. The relationship between the combatant and medic has a place of special trust in the military. The role

of military medicine supporting the combatant during wartime is described from a historic perspective by Keegan (1976). More recently Zajtchuck and Sullivan (1995) described advanced military medical technology and identified the chances of survival in battle are increased by rapid medical attention, the medical skill and experience of intervenors, and the diagnostic and interventional devices that facilitate medical care. Medical care in wartime begins with first aid training and buddy care.

Medical care during wartime and peacetime is a benefit of military service and has been extended to eligible family members (Poulsen, 1994). This entitlement could change with the restructuring of the nation's health care system (Garber & McNelis, 1995). Upon military retirement a military member and family members would have used medical care in various settings for at least twenty years and could become comfortable with the system based on familiarity with medical roles, structures, and protocols.

Roles and Structure. Air Force Basic Doctrine of the United States Air Force (Chief of Staff, 1997) discusses the make-up and structure of the Air Force. Military training involves learning specific role behaviors and goals for mission accomplishment. Training is described in materials e.g., Air Force Pamphlet 36-2241, Promotion Fitness Examination (1997). Uniformity and standardization are objectives for every training area. Therefore, extrapolation of this uniformity and standardization to other units occurs and is expected. Goals of the medical field involve getting people well and maintaining readiness for mission completion.

Medical Protocols. O-2 is the index of all Air Force Instructions and covers various disciplines to include military law, medicine, engineering, logistics, and others. O-2 provides standardization for the activities of these disciplines throughout the Air Force and oversees the implementation of Department of Defense instructions. Medical Air Force Instructions are derived from O-2 and cover specific approaches to medical treatment, (e.g., use of chaperones, management of terminally ill patients, or the discharge of patients). Air Force Instructions provide standards of medical care and guidelines for medical personnel to follow in various contingencies. Military personnel have expectations regarding the standardization of behaviors, quality of care, and accountability for services throughout the Air Force based on O-2 (Secretary of the Air Force, 1996).

Dependent Variable

Stress. In this study stress was defined as a person's immediate physiological and psychological responses to a specific precipitating event. A person's stress responses can be identified by measurement of physiological and psychological vital signs and then by a comparative, repeated measurement of responses. Stress responses are variable depending on the person. Guidelines for levels of physiological and psychological responses are in order. The following are examples of the dependent variable, stress, being operationalized by physical stress being measured with blood pressure screening and psychological stress being measured with a screening checklist, the mental status exam,

and the State and Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970).

Some physical stress responses may be very harmful if left unchecked. Pulse and blood pressure are measured as they are known to increase during anxiety (Chavez & Faber, 1987). Systolic and diastolic blood pressures above 160/100 may be indicative of borderline high blood pressure, hypertension, or stroke. Referrals for medical observation are in order. Thus, with instruments or hand measurement, this potentially harmful level of stress is quick and easy to determine.

In this study psychological stress was considered "a function of the interaction of the subjectively defined demands of a situation and the capacity of an individual to respond to these demands. Stress exists when the subjectively experienced demands are inconsistent with response capabilities" (Straus & Kantor, 1993, p. 46). Identification of initial and potential mental health problems can be accomplished by a screening checklist for gross signs of disturbances, (i.e., intoxication or psychosis). A mental status examination is used as a subtle check for signs of depression or suicidal ideation. Referrals for these disturbances are in order. The State and Trait Anxiety Inventory (Spielberger et al., 1970) measured anxiety levels of participants.

Although the Diagnostic and Statistical Manual of Mental Disorders (1994) categorizes two stress reactions disorders, Acute Stress Disorder and Post Traumatic Stress Disorder, the element of time is a significant factor for ruling out either diagnostic classification. The length of

time after exposure to a traumatic event to the experiencing of specified symptomology is a determining feature of the decision for classification. An Acute Stress Disorder would involve a disturbance lasting for a minimum of two days and a maximum of four weeks and occurring within four weeks of the traumatic event. Among the diagnostic criteria for Post Traumatic Stress Disorder is a time requirement for the duration of a disturbance being more than one month. Clearly, neither classification is applicable for the time frame of the present study.

Treatment Variables

Crisis Intervention has been described as a primary social work intervention used by social workers with family members (Ell, 1997). The experimental treatment variable, Cognitive-Behavioral and Applied Relaxation (CBAR), has been applied with family members (Jay & Elliot, 1980). The treatments represent two forms of effective interventions, based on earlier studies of CI (Kolotkin & Johnson, 1983; Viney et al., 1985) and CBAR (Bursish & Lyles, 1981, 1983; Lyles et al., 1982; Morrow & Morrell, 1982; Telch & Telch, 1986). The goals of both treatments are to reduce stress for family members; however, the active ingredients of these treatment techniques are quite different and delineate specific behaviors for the researcher (Silverman, 1986; Burns, 1980; Curtis & Detert, 1981). Further elaboration is now provided regarding assumptions behind the research implementing these treatment variables, a comparative analysis of the theories, the hypotheses, and the process of operationalization for this study.

Assumptions Behind the Research

A primary assumption regarding the problem for study in this research is that the components of human stress are capable of being measured and treated. This study allowed for measurement of the physiological and psychological components of stress before and after treatment application. Assumptions regarding treatment approaches are threefold: 1) suitability to the ER setting is a requirement of an intervention, 2) a comparative analysis of the usefulness of two theories could determine which theory might provide the most favorable outcome, and 3) a theory could incorporate additional approaches to treatment.

Suitability of Treatment Approaches to the Emergency Room

Five assumptions regarding the suitability of treatment approaches in the ER are delineated. Treatment would need to 1) meet some previously established standards, 2) be brief due to the nature of the ER setting, 3) allow for a nontraditional social work role, rather than a strictly clinical role, 4) be "portable" in that it could be provided in the ER and connected patient care areas, and 5) provide an approach that encompassed or appeared amenable to a biopsychosocial perspective in relation to stress, as stress has both physiological and psychological components. An explication of these assumptions is provided.

Practice Guidelines. The first assumption regarding treatment suitability involves meeting some standard guidelines for social work practice. Berlin (1983, pp. 1095-1096) recounted practice guidelines based on previous research findings: "1) analyze target problems broadly, accounting for multiple social and psychological causal

influences; 2) to define client goals narrowly in specific, feasible terms and according to the client's request; and 3) devise a problem-reduction strategy that the worker and client can implement to counterinfluence the major dimensions of the problem situation."

Implementing social work research on practice in the ER meets the three guidelines cited. In the ER setting the diverseness and severity of the patients' medical conditions impacts family members, whose stress levels may be exacerbated by other social or environmental problems. In the ER waiting room family members are generally focused on the status of the patients' conditions, but may choose to participate in clearly defined, brief interventions to alleviate associated stress and anxiety. In the ER family consulting room the randomized treatments provide engaging and easily measured problem-reduction strategies for the social worker and family member to use to alleviate stress for the family members.

Brevity: A Characteristic for Treatment in the Emergency Room Setting. The following characteristics form a central set of principles. These principles are augmented by three technical aspects that are assessed as fundamental to the practice of short-term treatment (Koss & Shiang, 1994, p. 668). The principles include: 1) The perspective that persons are able to make changes throughout their life span is the basis for any therapeutic goal; 2) The time needed to accomplish these goals is finite; and 3) The cultivation of a working union between therapist and participant is necessary to meet the treatment goals in a stated period of time.

The technical aspects supporting the principles of brief treatment are now enumerated: 1) participants must be carefully selected and excluded; 2) rapid initial assessment of the participant is provided; and 3) practitioner-researcher actions must serve to promote the preceding principles (Koss & Shiang, 1994, pp. 670-674).

These technical aspects supporting brief treatment are embodied in the research protocol and thus are explained. Participation in one of the treatment arms will only be offered to the family members of critically ill or injured patients who are admitted to the hospital. Criterion for study exclusion includes participants exhibiting intoxication or substance abuse, mental disorders, child or spouse maltreatment, suicidal or homicidal ideation, or the death of the patient. Monitoring blood pressure and heart rate and use of clinical measurement tools assists in providing rapid assessment of participants. The practitioner-researcher is ethically responsible for adherence to these standards for family member participation in accordance with the guidelines of the Institutional Review Boards of the University of Georgia and Keesler Medical Center, Keesler Air Force Base, MS. Both organizations approved this study.

Nontraditional Roles of the Social Worker. The term, nontraditional roles, refers to a change from a fixed view of social work provided to clients solely in a clinical setting by scheduled appointments. Social work in the ER includes on-call notification to the practitioner and involvement in a multidisciplinary team of health care professionals.

Portable Treatment. The term, "portable" treatment, refers to the flexibility of a treatment method for application in areas related or adjacent to the ER. For example, the social worker would be assisting family members not only in a family consulting room, but also, in the ER treatment area, the heart catheterization laboratory, the radiology department, or the operating room waiting lobby, while the patient receives medical attention.

Biopsychosocial Perspective. A fourth assumption regarding the suitability of a treatment approach is the view that the conceptual framework would need to either encompass or appear amenable to a biopsychosocial perspective in relation to stress reduction. Stress impacts the body, the mind, and the related components of the person's social situation. The biopsychosocial perspective includes an integrated view of the physiological and psychological aspects of the person along with his or her social context.

Physiological and Psychological Measurements of Stress. Viewing stress as a physical and psychological phenomenon addresses the mind-body relationship of the human condition (Benson, 1985, 1996; Rossi, 1993, pp. 38 & 247). The assessment and measurement of these components meet the research assumptions of incorporating a biopsychosocial perspective in relation to stress, plus, the assumption that the components of human stress are capable of being measured and treated (Benson, 1985, 1996).

In a summation, the primary assumptions for suitability of treatment approaches in the ER setting have been delineated. A critical analysis of the theories is provided

in the next section. This analysis of eight criteria also demonstrates that CI and CB meet the criteria of brief treatment (Koss & Shiang, 1994) and adhere to the previously described guidelines for practice approaches (Berlin, 1983). An examination of the criteria provides contrasts in the theories and their approaches. The contrasts are reviewed to evaluate the assumptions of suitability for treatment in an ER setting and to determine applicability to the problem of stress reduction.

Critical Analysis of the Theories

The previous section addressed assumptions for suitability of treatment approaches in the ER. Crisis Intervention (CI) and Cognitive-Behavioral (CB) interventions are two plausible approaches commonly applied in situations identified as emotionally overwhelming and threatening to human relationships or to the social and environmental contexts in which they occur, as in this study. The following is a critical analysis of the theoretical frameworks of CI and CB.

Criteria Selection and Justification

Argyris and Schon's (1987) criteria for evaluating any theory were chosen based on their general nature and their applicability to both theoretical and intervention models. The criteria include generality, relevancy, consistency, completeness, testable nature, centrality, simplicity, and complexity. CI and CB are addressed against these eight criteria.

Critical Analysis of Crisis Intervention

Generality. CI appears to be applicable to different age groups (Klein & Lindemann, 1961; Maton, 1989), genders

(Viney et al., 1985), cultures (Bromley, 1987; Weiss & Parish, 1989) and various populations, e.g., farm families, (Van Hook, 1987) cancer groups (Gilbar, 1991; Taylor, Folkes, Mazel, & Hilsberg, 1988), persons with Acquired Immunity Deficiency Syndrome (Gambe & Getzel, 1989), and juvenile offenders (Stewart, Vockell, & Ray, 1986). The intervention is able to be used in a short term treatment environment by multiple disciplines (Butcher & Maudal, 1976; Ewing, 1990). The generic approach is focused on what the specific crisis means to the person and the goal, adaptation, is an easily recognized, universal human response (Caplan, 1964; Jacobson et al., 1968; Klein and Lindeman, 1961;).

Relevancy. CI is highly relevant in that it specifies etiology, mechanisms, responses, and treatment of the crisis (Ell, 1997; Ewing, 1990). There is congruency between the model of equilibrium and disequilibrium and, also, recognition of human involvement in a process that was precipitated by an event, which does not "pathologize" the person (Caplan, 1964; Golan, 1987; Lindemann, 1944; Parad & Parad, 1990; Slaikau, 1990). Treatment may be applied globally in the aftermath of various situations, for example, rape, earthquakes, deaths of significant others (Ewing, 1990; Koss & Shiang, 1994).

Consistency. CI appears to be noncontradictory in concepts about crisis, crisis sequence, and goals (Golan, 1987; Parad & Parad, 1990; Slaikau, 1990). The model is patient driven and centered, which also requires practitioners assume more nontraditional roles, as crises occur anywhere and at anytime (Ewing, 1990).

Completeness. CI appears complete in construction with definitions of concepts and cause and effect linkages between concepts (Butcher & Maudal, 1983; Ewing, 1990). CI is applicable for intervention with individuals, groups, and families (Ell, 1997; Ewing, 1990; Slaikeu, 1990). However, CI does not appear amenable to encompassing the individual biological aspects of human beings, but appears to be more focused on environmental or external systems for support with adaptation, for example, families, friends, and communities (Gambe & Getzel, 1989; Gilbar, 1991; Maton, 1989; Wright, Ursano, Bartone, & Ingraham, 1990).

Testable. It is possible to think of conditions under which CI would be mistaken, (i.e., no personal interactions could be effective if a person was in physical pain, under the influence of psychoactive substances, or mentally incompetent).

Centrality. The concepts of person-in-environment and personal developmental stages (Butcher & Maudal, 1983; Ewing, 1990; Slaikeu, 1990) appear fundamental to integrate observations, adaptive mechanisms, and treatment under CI. Few psychobiological and pharmacological studies have been completed to validate interactions between body and mind with CI application.

Simplicity. CI appears to have a systems-related approach (Ewing, 1990; Slaikeu, 1990) and a greater societal orientation, underscoring the commonality of crisis experience, and normalizing of a threatening event. Simplicity in treatment may also allow for application by many disciplines. Length of treatment is minimal (Koss & Shiang, 1994).

Complexity. This criterion is shown in CI approaches that take into account the crisis, the person, and the social environment (Butcher & Maudal, 1983; Ewing, 1990; Slaikau, 1990). Four levels of crisis intervention are explicated by Jacobson et al. (1968). Complexity is noted by the authors in the processes of 1) environmental manipulation and general support, 2) dynamically oriented supportive psychotherapy, 3) techniques helpful in resolution of specific crises, and 4) understanding personality dynamics and how a crisis may have originated.

In a summation, CI theory met all eight criteria of Argyris and Schon's criteria for evaluating any theory.

Critical Analysis of Cognitive-Behavioral Approach

Generality. CB interventions are applicable to different age groups, that is, adults (Hollon & Beck, 1994), children (Jay et al., 1987; Stark, Reynolds, & Kaslow, 1987) and adolescents (Reynolds & Coates, 1986); genders (Burden, 1980), and ethnic groups (Jemmott, Jemmott, & Fong, 1992), and are able to be used in a short term treatment environment by multiple disciplines, namely, social work (Dryden & Scott, 1991), child and adult psychology (Kendall & Panichelli-Mindel, 1995; Meichenbaum & Deffenbacher, 1988), and religious counseling (Tan, 1987). The focus of CB is on persons who in turn examine the validity of their own unique, specific beliefs. The individual dispels personal cognitive distortions that are categorized as common to people in general (Burns, 1980; Meichenbaum & Fitzpatrick, 1993).

Relevancy. CB shows relevancy in its definition of etiology, which is applicable to the range of human

experiences, yet deals with an individual's specific cognitions about his or her responses to a particular situation (Abramson et al., 1989; Beck et al., 1979; Hollon & Beck, 1994; Meichenbaum & Deffenbacher, 1988). Treatment may also be applied globally, in numerous situations, according to the practitioner (Dryden & Scott, 1991; Meichenbaum & Deffenbacher, 1988).

Consistency. CB appears noncontradictory in its concepts, particularly about universality of etiology (Carmine & Dowd, 1988; Kendall & Panicelli-Mindel, 1995). CB appears patient driven and centered. Most theorists tend to agree on models of treatment; however, some cognitive-behavioral theorists lean toward a constructivist approach of reality as a product of personal meanings that persons create (Hollon & Beck, 1994; Meichenbaum, 1993; Meichenbaum & Fitzpatrick, 1993). The therapists' characteristics conditions do not appear to be absolute conditions for a client to be able to change. Meichenbaum and Deffenbacher (1988) describe the development of a "warm, collaborative" relationship between the therapist and client, while Kendall and Panicelli-Mindel (1995) identify the importance of specific role and related activities of the therapist, (viz., consultant, diagnostician, and educator).

Completeness. CB appears feasible and complete upon examination of the underlying concepts and cause and effect linkages (Hollon & Beck, 1994). CB provides for intervention with individuals (Beck et al., 1979; Glass & Getka, 1990; Ludwick-Rosenthal & Neufeld, 1988) and groups (Jay & Elliott, 1990; Scott, 1989). Charles Figley has been identified as a pioneer helping families experiencing trauma

(Meichenbaum, 1994) by correcting distortions, clarify insights, and discovering strengths (Figley, 1989).

Upon examining the assumption that changes with cognition impact feelings and behavior (DeRubeis et al., 1990; Rush et al., 1981), CB approaches appear more amenable to incorporating the biological aspects of human beings. Physical states can impact emotional states and behaviors. Hollon and Beck (1994, p. 452) identify that cognitive-behavioral approaches in behavioral medicine tend to "help people who are relatively well adjusted deal with negative life events that fall outside the range of everyday human experience" (e.g., cancer and acquired immune deficiency syndrome.)

Testable. Treatment may or may not be applicable under varied conditions (e.g., no personal interactions could be effective if a person was in physical pain, under the influence of psychoactive substances, or mentally incompetent).

Centrality. The central focus is on cognitive interpretation of experiences, not just environmental experiences or the relationship of thought and behaviors (Kendall & Panichelli-Mindel, 1995). Psychobiological and pharmacological studies have been completed and validated interaction between body and mind, for example, Cognitive-Behavioral techniques and pharmacotherapy used for headaches and depression (Blanchard, 1992; Holyrod, Nash, Pingel, Cordingley, & Jerome, 1991; McClean & Hakistan, 1979; Rush et al., 1977; Rush et al., 1981).

Simplicity. CB is less systems-related and has a greater individual focus with easily taught self-statements

for repeated use by the person over time. Teaching of self-statements can help the person deal with overwhelming situations in an efficient manner (Burns, 1980). Current issues are nonreducible to earlier conflicts (Kendell & Panichelli-Mindel, 1995). Brevity is a key characteristic (Dryden & Scott, 1991).

Complexity. Complexity is seen in the possible integration of physiological and psychological approach.

In a summation, CB theory met all eight criteria of Argyris and Schon's criteria for evaluating any theory. The contrasts between CI and CB will be discussed in a later section.

Results of the Analysis and an Examination of Criteria and Research Assumptions

The application of Argyris and Schon's (1987) framework for analyzing any theory revealed that both CI and CB meet the overarching criterion for usefulness. Some differences in the theories are evident when examining their comparisons in four criteria categories: generality, consistency, completeness, and centrality. The contrasts are discussed in the criteria categories of the following section.

Further examination of the eight criteria against the underlying research assumptions is also provided. The research assumptions reiterated are that treatment 1) meets some previously established practice standards, 2) is brief, 3) can be provided by nontraditional roles, 4) is portable, and 5) is amenable to a biopsychosocial perspective of stress.

Generality. Both CI and CB appear to be applicable to different age groups. This parallels a basic therapeutic

goal, the view that persons are capable of changing throughout their life spans. This supportive technical assumption appears to be met in the brief treatment approaches of CI and CB. A contrast in treatments for this category is that the stated goals of treatment for CI and CB are different.

Relevancy. Both treatments are able to be provided globally by the practitioner, thereby meeting the assumption behind the research of a "portable" treatment approach relevant to the ER setting.

Consistency. The conceptual frameworks of CI and CB appear to be noncontradictory. The role of the practitioner meets the assumption of nontraditional social work roles. Practitioners can apply the CI and CB approaches outside of a mental health or crisis center settings. A contrast between CI and CB for therapist's condition is that under CB, Meichenbaum and Deffenbacher (1988, p. 69) identified "warmth" as a therapist's condition to facilitate a person's change.

Completeness. A contrast in this category is that CI appears more focused on systems, person-in-environment, and adaptation and less amenable to encompassing the biological aspects of human stress factors. CB appears more amenable to incorporating the biopsychosocial perspective, in that changing cognition alters psychological and physical states.

Testable. Conditions could be found under which CI and CB could be mistaken, namely, no personal interactions could be effective. A theory's testability is a sign of its meaning. Inferences must be able to be made about a theory.

Centrality. A contrast in this category is that the completion of psychobiological and pharmacological studies on CB further indicate amenability to a biopsychosocial perspective, which is not evidenced by CI.

Simplicity. The length of time for either treatments is brief or minimal, meeting the assumptive, technical aspect that is fundamental to short-term treatment.

Complexity. Complexity is seen in CI with the model's taking full account of the crisis, the crisis sequence, and incorporation of adaptive coping skills. Complexity is noted in CB with the integration of cognitive and behavioral treatment approaches.

In a summation, CB theory met all eight criteria of Argyris and Schon's (1987) criteria for evaluating any theory. The contrasts in the two theories will be discussed in a later section.

Rationale for the Addition of Applied Relaxation to Cognitive Behavioral Treatment

From the application of Argyris and Schon's (1987), criteria analysis, both theories meet the eight criteria for usefulness. While CI and CB were identified as meeting the category for completeness, CI was identified with a person-in-environment perspective. CB appeared to have a biopsychosocial perspective. This perspective may make the theory amenable to the addition of techniques aimed at altering physiological and psychological stress conditions. Changes in a person's physical and psychological condition could produce changes in behavioral responses.

Comparison of Methods for Eliciting Total Body Relaxation

A prominent early author who studied stress was Hans Selye (1976, 1980 - 1983) and his contemporaries who studied stress and relaxation were Benson (1975) and White and Fadiman (1976). A comparison of outcome measures for classical relaxation methods indicated that progressive relaxation decreased muscular tension, while Benson's method, transcendental meditation, Zen and Yoga were found to decrease oxygen consumption, respiratory rate, heart rate, and blood pressure. Hypnosis with suggested relaxation decreased oxygen consumption and respiratory rate and heart rate, but blood pressure measurements were inconclusive (Benson, 1975; White & Fadiman, 1976).

Relaxation exercises promote inborn and interconnected physiological changes (Curtis & Detert, 1981, p. 50). It follows that these changes are a counter-influence to the stress response. Several relaxation techniques can elicit the relaxation response. The effects of the relaxation response include: 1) decreased respiration and decreased oxygen utilization, 2) decreased heart rate and blood pressure, and 3) decreased tension in the major muscle groups. These methods are useful for restoring body balance after physical arousal. When practiced, these methods can be used before physical arousal. Thus, if the stress response is evoked, the intensity may not be as strong, and usually a faster return to a balanced state is achieved.

Based on the comparison of relaxation methods and the explication of the stress response, a rationale can be developed for incorporation of the relaxation response to counterbalance the stress response. Teaching the use of

breathing exercises and muscle relaxation can counter the physiological responses to stress. When the stress response is present, stress can be measured by heart rate, blood pressure, salivary cortisol, and psychological assessment. Relaxation response can be taught and then measured. Family members who accompany critically ill or injured patients to the ER are known to display stress responses. An ER is a natural environment for the study of stress and research on the treatment to reduce the stress response. Applied relaxation can be combined with Cognitive-Behavioral techniques as a comparative method to Crisis Intervention, the primary social work intervention in the ER.

The Conceptual Framework of Cognitive-Behavioral Intervention and Applied Relaxation Techniques

The conceptual framework for the experimental intervention used in this study includes CB theory, the application of Cognitive-Behavior techniques, plus, Applied Relaxation techniques (viz., breathing exercises and muscle relaxation of the large muscle groups in the neck, arms, and legs).

Active Ingredients of Cognitive-Behavioral and Applied Relaxation

The active ingredients of the Cognitive-Behavioral and Applied Relaxation intervention used in this study include 1) encouraging the participant's narrative of the stressor, 2) identifying and using the participant's metaphors of the trauma, 3) disconfirming irrational or negative beliefs, 4) addressing the participant's physiological stress with deep breathing exercises and muscle relaxation and having the participant describe any changes in their physiological

responses, 5) reinforcing the participant's use of the relaxation exercises to manage future stressors, 6) preparing the participant to see the patient, and 7) providing referrals to appropriate community agencies.

Active Ingredients of Crisis Intervention

In comparison, under Crisis Intervention, the participant relays a history of the precipitating event, provides a brief family and health history, identifies coping skills used in past experiences, lists personal sources of strength, and identifies family supports and social networks. The participant is prepared for meeting the patient in the ER environment. Referrals are made to appropriate community resources. CI does not specifically address the physiological aspect of stress, but addresses coping methods and the use of support systems.

In a summation, the CBAR model takes into account physical aspects of stress. The addition of applied relaxation techniques to CB may be more effective for reducing stress. CBAR takes into account the physiological aspect of stress, the mind-body connection, and the biopsychosocial perspective of social work practice.

An independent variable that addresses physical stress with specific techniques for reducing blood pressure, heart rate, salivary cortisol, and psychological stress, seems to provide a more holistic approach for treating family members of critically ill and injured ER patients. Crisis Intervention theory, oriented to person-in-environment and systems perspective, does not address the physiological aspects of stress in its conceptual framework of equilibrium

and disequilibrium. Therefore, CBAR would seem theoretically to be the more favorable treatment approach.

Outcome Measures

Participants in the study were randomized into treatment groups for CI and CBAR. The outcome measures applied pretest and posttest were salivary cortisol samples, heart rate, and mean arterial pressure, and the State and Trait Anxiety Inventory. Mean arterial pressure (MAP) is the pressure in the arteries, averaged over time. MAP combines systolic and diastolic blood pressure in a formula which takes into account the exercising and resting blood pressure, and persons having diseased and healthy hearts. Berne and Levy (1996, p. 291) explain that, "Mean arterial pressure, \overline{Pa} , usually can be estimated satisfactorily from the measured values of the systolic (P_s) and diastolic (P_d) pressures by means of the following formula:

$$\overline{Pa} \approx Pd + (Ps - Pd)/3. "$$

The use of a composite score for mean arterial pressure may be a better way to operationalize the independent variable CBAR. This is a fairly new way to operationalize this measure. To date no research on CI, CB, or CBAR has been conducted in the U.S. Air Force medical center emergency rooms.

Summary

Stress responses have physiological and psychological components, which can be assessed and measured. The proposed combination of CB techniques and applied relaxation addresses both aspects of the stress response. The immediate effects of the applied techniques directed at stress reduction in the ER were proposed for study. An expectation

of health care systems is that family members provide support to the patient and attend to numerous concrete tasks. The ER social worker provided CB and AR techniques, which aid the family member complete these dual tasks.

Hypotheses and Operationalization

The general research question is thus stated: Does the application of CBAR reduce the stress levels of family members in the emergency room better than CI. Four related research hypothesis to be tested are as follows:

- H 1) CBAR is associated with greater reduction in salivary cortisol levels than CI for family member treatment in the Emergency Room.
- H 2) CBAR is associated with greater reduction in mean arterial pressure than CI for family member treatment in the Emergency Room.
- H 3) CBAR is associated with greater reduction in heart rate than CI for family member treatment in the Emergency Room.
- H 4) CBAR is associated with greater reduction in STAI scores than CI for family member treatment in the Emergency Room.

The independent variables were CBAR and CI interventions. The dependent variables are the stress responses measured by increases in salivary cortisol, mean arterial pressure, heart rate, and responses to the State and Trait Anxiety Inventory.

CBAR Interventions

Step I: Concept. Cognitive Behavioral and Applied Relaxation (CBAR)

Step II: Explication. CBAR interventions are applied after a family member has accompanied a patient to the ER due to a critical illness or injury. The active ingredients include a set of interventions which incorporate focused questions regarding the stressor and relaxation techniques.

Step III: Empirical Concept. When family member(s)/ significant other(s) have accompanied a critically ill or injured patient to the ER who will be admitted to the hospital, the researcher approaches them regarding volunteering in the study. After enrollment the participant was assigned by a process of randomization to either the comparison or experimental group.

Screening for enrollment in the study includes the following: 1) Prospective participants must be eligible for military medical care, 2) all enrollees must be between the ages of 18 to 85, 3) the participants cannot be suicidal, homicidal, psychotic, or in dissociative states, 4) volunteers who have eaten within less than 30 minutes of the salivary cortisol sample will not be eligible for enrollment, 5) participants whose heart rates exceed 160/100 will be referred to the ER nursing staff and/or physicians, 6) If the patient dies in the ER while the study is being conducted with the family member, participation will be halted and ER protocol will be followed, 7) If at any time a volunteer chooses to end participation in the study, the intervention will cease, 8) ER protocol requires the physician to give information to the family member(s) regarding the patient's diagnosis. The physician will be contacted during the study if the family member desires to know the patient's current status, and 9) Participants of

both the experimental and comparison groups will receive referrals for further services when warranted.

The experimental group was exposed to one session of CBAR intervention that involves: Focused questions to help the participant specify the stressor in his/her own words (identification of metaphors for the stress) and allows the researcher to assist the participant in disconfirming irrational beliefs regarding the stressor. The researcher explains the relaxation techniques and coaches the patient in regulated, deep breathing exercises and large muscle relaxation for the shoulders, upper arms, forearms, calves, and thighs. The participant describes the experience for the researcher. Afterward, the researcher and participant then meet with the patient and/or physician. Referrals for further services are completed. The participant receives the signed copy of the Informed Consent Document and an information sheet on the CBAR exercises. Generally, the researcher accompanies the patient and participant to the Intensive Care Unit, Cardiac Care Unit, or medical ward.

Step IV: Rules of Correspondence Applied to the Experimental Intervention. For the first hypothesis, I concluded that if CBAR intervention did not occur when the family member/significant other accompanied the patient to the ER, then the likelihood of a prolonged stress response would be noted by increased scores on cortisol sample assays.

For the second hypothesis, I concluded that if CBAR intervention did not occur when the family member or significant other accompanied the patient to the ER, then

the likelihood of a prolonged stress response would be noted by increased scores on mean arterial pressure.

For the third hypothesis, I concluded that if CBAR intervention did not occur when the family member or significant other accompanied the patient to the ER, then the likelihood of a prolonged stress response would be noted by increased scores on heart rates.

For the fourth hypothesis, I concluded that if CBAR intervention did not occur when the family member or significant other accompanied the patient to the ER, then the likelihood of a prolonged stress response would be noted by increased scores on the State and Trait Anxiety Inventory (STAI).

Step V: Operationalization. The first 98 participants comprised the total number for the study. All 98 completed either the CBAR or the comparison group intervention of CI. The study began with the first group of eligible referred patients and ended with the ninety-eighth patient. The study took place in the Emergency Services Department of Keesler Medical Center, Keesler AFB, MS.

Dependent Variables: Salivary Cortisol, Mean Arterial Pressure, Heart Rate, and Psychological Response to Stress

Step I: Concepts. Physiological and psychological stress

Step II: Explication. Stress is considered the physiological and psychological response to a stimulus. This study proposes to research physiological and psychological responses to stress experienced by family members/significant others accompanying patients to the ER, who are to be admitted to the hospital.

Step III: Empirical Concept. Three physiological measures of stress included increased mean arterial pressure, heart rate, and salivary cortisol. Pulse and blood pressure were measured as they are known to increase during anxiety (Chavez & Faber, 1987). Cortisol, a hormone secreted by the adrenal gland, was proposed as a measure because it is also known to increase during stress (Neese et al., 1985). Psychological stress is considered "a function of the interaction of the subjectively defined demands of a situation and the capacity of an individual to respond to these demands. Stress exists when the subjectively experienced demands are inconsistent with response capabilities" (Straus & Kantor, 1993, p. 46). The State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1970; Spielberger, 1985) was chosen to measure stress and anxiety. Coefficient alpha reliability ranges from $\underline{r} = .83$ to $\underline{r} = .92$ for the A-State scales and is equally high for the A-Trait scales. The test-retest correlations for the A-Trait scale are high, ranging from .73 to .86, while A-State correlations are low, ranging from .16 to .54 with a median \underline{r} of .32 for the six subgroups that were tested (Spielberger et al., 1970, p. 9).

Concurrent validity was determined using the IPAT Anxiety Scale (Cattell & Scheier, 1963) and the Taylor Manifest Anxiety Scale (TMAS) (Taylor, 1953). Concurrent validity between the STAI A-trait scale and the IPAT was .75 with college females ($N = 126$) and .77 with mental health patients ($N = 66$). In the same testing conditions, concurrent validity between the STAI A-trait scale and the

TMAS was .80 with college females (N = 126) and .79 with mental health patients (Spielberger et al., 1970, p. 9).

The protocol studied physiologic and psychological stress responses induced by health-related family stressors, plus, a comparison of outcome measures for cognitive-behavioral and applied relaxation and the standard social work intervention for family members.

Step IV: Rules of Correspondence. For the dependent variables in the hypotheses, I concluded that not every person who accompanies a critically ill or injured patient will develop stress responses. However, when a traumatic event occurs an emotional or physical response is in the realm of human reactions. Intervention may not prevent acute stress responses. Interventions could lower the severity or frequency of responses, which would be reflected in lower scores for salivary cortisol, mean arterial pressure, heart rate, and the Self-Report Inventory. Overall effects of CBAR could be benign in the least.

Step V: Operationalization. Systolic and diastolic blood pressure and pulse were taken by a nurse or medical technician, while salivary cortisol samples and administration of the Self-Report Inventory were completed by the researcher. These measurements were completed pre and post intervention for all willing study participants.

Chapter IV

Methods

Research Design

The research design was a hybrid of the true experimental design, specifically the pretest-posttest control group design (Campbell & Stanley, 1963).

R	O1	X1	O2
<hr/>			
R	O3	X2	O4

Individuals were the unit of analysis. The experimental group received CBAR, while the comparison group received the standard procedure used in the hospital ER. The manipulated independent variable was the CBAR intervention. The dependent variables were the physiologic and psychological stress levels of family members (or significant others).

The pretest-post control group design used for this study was equivalent groups, with participation in the comparison group and experimental group achieved by randomization. The pretest-post control group design controlled for weaknesses to internal validity, such as, the rival hypotheses of testing, instrumentation, maturation, regression, selection, mortality, and history (Campbell & Stanley, 1967, pp. 13-14).

Considerations for weaknesses to internal validity in this study were that experimental mortality could have

increased if subjects experienced severe reactions in relation to a change in the patient's status. Pulse rate measurements were problematic as they were either taken by hand or machine by the available nurse or medical technician on duty at the time of the study. History through specific events occurred between the pretest and posttest, namely, changes in patient status. The study was too short for biological maturation to occur. Increased attention was given to the timing of intervention, to avoid bathroom breaks or participants whose timing for the last meal would interfere with salivary cortisol collection. Instrumentation of psychological measures was not problematic in this study, as the STAI was the only tool applied by the researcher.

A weakness to external validity or representativeness was reactivity of the interaction effect of testing. The subjects who were exposed to the State and Trait Anxiety Inventory (STAI) pretest could monitor and change their reports for the post test. Such desensitization could have made the results gained for the pretested group unrepresentative of the effects of the CBAR for the unpretested population accompanying family members or significant others to the emergency room.

Given the reality of the ER environment, the pretest-posttest control group design was feasible; however, it could have created a second threat to external validity, the reactive effect of the experimental arrangement. Treatment in an ER may not be considered a classical laboratory experimental setting. Also, this was not a civilian ER but a military service-related ER.

Sampling Procedures

The first 98 subjects meeting the criteria for participating in the research were studied. This was considered a purposive sample. The sample size consisted of 98 adult family members and/or significant others. Each experimental and comparison group in the study was composed of research participants. Participants consisted of male and female adults age 18 to 85. Significant others included the following relationships: common-law marriage partners, fiances, neighbors, or best friends. All participants were required to be eligible to receive medical care in a military hospital. Research conditions included family members accompanying critical patients in the ER at Keesler Regional Medical Center, Keesler AFB (KAFB) in Biloxi, MS.

This study showed a weakness in nonrepresentativeness. All combinations of family members and all ranks of the military were not available in the emergency room. The subject sample did not adequately reflect the full population of military families to which this author wanted to extend the results. A threat to internal validity was selection bias, because of the unknown characteristics of those persons who declined to participate in the study (Rubin & Babbie, 1993, p. 268)

Ethical considerations included authorization for human subjects testing within the requirements of the Department of Defense, Keesler Air Force Base, Biloxi, MS, and the Institutional Review Board, University of Georgia. Study participants were informed of testing, limits of confidentiality, and written informed consent documents.

Data Collection

The following were chronological procedures of the research. The researcher introduced the study and witnessed written consent signing. Each family member/significant other had measurements of their blood pressures and heart rates taken by a medical technician or nurse and each participant provided a saliva sample for cortisol testing. Each participant completed the pretest questionnaire (State-Trait Anxiety Inventory, STAI Form X-1) with instructions from the researcher. The researcher assigned randomly the family member or significant other to the experimental or comparison group according to a randomization table prepared by the Clinical Research Laboratory. The participants assigned to the experimental group received CBAR intervention from the researcher, while the comparison group received standard social work treatment in the emergency room from the researcher. Before leaving the unit, all participants had blood pressure and heart rate measurements, provided saliva samples for cortisol screening, and completed the posttest measurement of the questionnaire (State-Trait Anxiety Inventory, STAI Form X-2).

This research fit the (I) Experimental Study, Sub-Type B, Field Experiments classification of empirical research. The primary purpose was hypothesis testing concerning cause-effects relationships. A characteristic of this class of research is manipulation of either one or more independent variables in a natural setting (Tripodi, Fellin, & Meyer, 1969).

Time Frame

Data were collected during the period approved by both the Institutional Review Boards of the University of Georgia and Keesler Medical Center (January 1998-August 1998). Data collected for the pilot study (28 February 1997-5 January 1998) were also included in the dissertation project and subsequent analysis.

Analysis and Interpretation

This research study examined the effectiveness of CBAR versus CI techniques for reducing stress for family members accompanying critically ill or injured patients to the ER. Contrasts were made with the comparison group, who received standard social work treatment, CI. The two groups received pretest and posttest measures on physiological and psychological responses. Descriptive univariate statistics are provided for the nominal-level demographic variables and an Analysis of Covariance was used to compare statistically the dependent variable measures. The following chapter discusses the results of the above data analysis.

Chapter V

Results

To reiterate, the purpose of this study was to identify systematically client characteristics, delineate the effectiveness of two interventions, and differentiate outcomes on physiological and psychological measures for family members of emergency room patients. The objective of the study was to assist practitioners with useful assessment and measurement techniques and effective treatment approaches for family members in the emergency room setting. Results are discussed in the following sequence: demographic characteristics are first presented, the four hypotheses and their statistical analyses are discussed, and finally an analysis of outcome data is provided.

Table 1 of this chapter begins with information regarding those persons who chose not to participate in the last data collection period. Raw data from descriptive categories, age, gender, ethnicity, position, and patient diagnosis, are presented to give the reader a profile of the nonvolunteers along with anecdotal remarks. A visual review of the raw data ($n = 13$) shows more of the nonparticipants (8) were under age 50. A larger number of nonvolunteers were male (9), than female. Nonparticipants were represented by a white majority (10). A rank ordering of nonvolunteer family positions included husbands (5), wives (3), fathers (3), and mothers (2). Selection bias is a threat to internal

validity. Table 1 provides some salient characteristics of the nonparticipants.

Demographic Characteristics of Nonparticipants (n = 14)

<u>Age</u>	<u>Gender</u>	<u>Ethnic</u>	<u>Position</u>	<u>Diagnosis</u>	<u>Reason</u>
70s	M	W	Husband	MI*	Not Stressed!
30s	M	B	Husband	Sickle Cell	Child at home
50s	F	W	Wife	Kidney Stone	Prefers not
60s	M	W	Wife	CHF*	Too tired
40s	F	O	Husband	COPD*	No English
60s	M	W	Wife	MI*	Choose not to
30s	M	W	Father	Ab. Obstruct*	Child care
30s	F	W	Mother	Ab. Obstruct*	Child care
40s	M	W	Father	Pneumonia	Just ate
40s	F	W	Mother	Pneumonia	Just ate
40s	M	B	Father	Femur Fracture	Child at home
40s	M	W	Husband	MI*	Mental PX
60s	M	W	Husband	Emphysema	Intoxicated
60s	M	W	Husband	Pancreatitis	Family Friend

*MI = Myocardial Infarction; *CHF = Chronic Heart Failure;

*COPD = Chronic Obstructive Pulmonary Disease; and

*Ab. Obstruct = Abdominal Obstruction

Visual examination of the data reveals that nonparticipants are younger and may have different constraints on their time. These conditions reflect the U.S. Bureau of the Census (1990) profile of a young military population who are between the ages of 20 and 45, who are predominately married and who are parenting children.

In summation characteristics of nonparticipants appeared to follow the current trend in age and lifestyle attributes of military population. This can be compared to the characteristics of the study participants.

A systematic identification of client characteristics and an analysis of the extent to which persons in the groups differ follows. Descriptive statistics in Table 2 show the frequencies and percentages for military status, gender, blood pressure medication use, and family position. Median age and minimum and maximum ranges are reported for the experimental and comparison groups.

Table 2 indicates that approximately 82% of the study participants were retired military personnel or their family members. This reflects a national trend of decreasing active duty members and their family members and a steadily growing number of retired military who are eligible for medical care. The median ages for the experimental and comparison groups are 57 and 61, respectively. The number of males and females in both groups are nearly equivalent. Wives, then husbands, were the family positions most frequently participating in either treatment group. In Table 2 the difference in percentages between persons in the experimental group not taking blood pressure medication vs. those who do is 55.2%, while in the comparison group the difference is 26.6%.

Table 2

Descriptive Statistics for Groups (N = 98)

<u>Variables</u>	<u>Experimental Group</u>		<u>Comparison Group</u>	
	(n = 49)		(n = 49)	
	Frequency	%	Frequency	%
<hr/>				
Status				
Active Duty(AD)	4	8.2	8	16.3
AD Family	5	10.2	4	8.2
Retired Military(RM)	17	34.7	15	30.6
RM Family	23	46.9	22	44.9
Totals	49	100	49	100
<hr/>				
Gender				
Male	21	42.9	22	44.9
Female	28	57.1	27	55.1
Totals	49	100	49	100
<hr/>				
Blood Pressure Medication				
No	38	77.6	31	63.3
Yes	11	22.4	18	36.7
Totals	49	100	49	100
<hr/>				

continued

Table 2

Descriptive Statistics for Groups (N = 98) (continued)

<u>Variables</u>	<u>Experimental Group</u>		<u>Comparison Group</u>	
	(n = 49)		(n = 49)	
	Frequency	%	Frequency	%
<u>Family Position</u>				
Wife	23	46.9	21	42.9
Husband	15	30.6	20	40.8
Father	1	2.0	1	2.0
Mother	3	6.1	1	2.0
Stepfather	1	2.0	0	0
Stepmother	0	0	1	2.0
Daughter	1	2.0	4	8.2
Son	1	2.0	1	2.0
Son-in-law	1	2.0	0	0
Friend	3	6.1	0	0
Totals	49	100	49	100
<u>Age</u>				
Median	57		61	
Minimum	21		19	
Maximum	82		82	

Table 3 displays the results of bivariate analyses, cross-tabulations and Pearson Chi-Square test of significance, to determine the relationships between the categorical variables of interest and the treatment groups. The Chi-square test, a nonparametric statistic, is used to assess whether the observed frequencies in a contingency table are equal to or significantly different from the expected frequencies (Weinbach & Grinnell, 1991). Chi-square results follow this guideline, that no cell has an expected value less than 1.0 and not more than 20% of the cells have expected values less than five (SPSS, 1998). Table 3 shows that the variables, status, family position, season, ER visits, and admissions, have cell counts less than five. So this statistic may not be a valid measure.

Included in Table 3 is age, a discrete variable, that is less influenced by outliers. As the variable age may possibly be distributed differently between the groups, an alternative statistical test was used. The Mann Whitney *U* Test, a nonparametric analog to the *t* test, can be considered when a variable is not normally distributed. Thus, the Mann-Whitney *U* test determines whether the distributions of scores in the two independent groups were drawn from two identical population distributions (Weinbach & Grinnell, 1991).

Table 3

Relationships Between Variables and Treatment Groups

<u>Variables</u>	<u>Experimental Group</u> (n = 49)	<u>Comparison Group</u> (n = 49)
Status	Frequency	Frequency
Active Duty (AD)	4	8
AD Family	5	4
Retired Military (RM)	17	15
RM Family	23	22
$\chi^2 = 1.592, df = 3, p\text{-value} = .661.$		
Gender	Frequency	Frequency
Male	21	22
Female	28	27
$\chi^2 = .041, df = 1, p\text{-value} = .839.$		
Season	Frequency	Frequency
Spring	33	34
Summer	7	7
Fall	2	3
Winter	7	7
$\chi^2 = .548, df = 3, p\text{-value} = .908.$		

continued

Table 3

Relationships Between Variables and Treatment Groups
(continued)

<u>Variables</u>	<u>Experimental Group</u> (n = 49)	<u>Comparison Group</u> (n = 49)
Family Position	Frequency	Frequency
Wife	23	21
Husband	15	20
Father	1	1
Mother	3	1
Stepfather	1	0
Stepmother	0	1
Daughter	1	4
Son	1	1
Son-in-law	1	0
Friend	3	0

$$\chi^2 = 9.605, df = 9, p\text{-value} = .383.$$

Blood Pressure Medication

No	38	31
Yes	11	18

$$\chi^2 = 2.400, df = 1, p\text{-value} = .121.$$

continued

Table 3

Relationships Between Variables and Treatment Groups
(continued)

<u>Variables</u>	<u>Experimental Group</u> (n = 49)	<u>Comparison Group</u> (n = 49)
ER visits	Frequency	Frequency
1	27	25
2	9	8
3	5	2
≥4	8	14
$\chi^2 = 3.058, df = 3, p\text{-value} = .3828.$		
Admissions	Frequency	Frequency
1	32	30
2	13	12
3	1	2
≥4	3	5
$\chi^2 = .938, df = 3, p\text{-value} = .8163.$		
Median Age	<u>Experimental Group</u> (n = 49)	<u>Comparison Group</u> (n = 49)
	57	61
Mann Whitney U Test = .313		

Table 4 displays the descriptive statistics, mean, and standard deviation, for the outcome measures, at pretest and posttest for both groups. For the experimental group on all measures, pretest to posttest, mean scores decreased. For the comparison group, mean arterial pressure (MAP) showed a slight increase; however, heart rate (HR), salivary cortisol (SC), and the psychological assessment, (STAI), decreased in mean scores.

Table 4

Descriptive Statistics for Groups by Outcome Measures

<u>Variable</u>	<u>Experimental Group</u>		<u>Comparison Group</u>	
	Pretest	Posttest	Pretest	Posttest
<hr/>				
<u>MAP</u>	(n = 49)		(n = 49)	
<u>M</u>	109.0816	105.2925	<u>M</u>	103.0884 103.6122
<u>SD</u>	14.3578	15.8845	<u>SD</u>	12.4573 13.1412
<u>HR</u>	(n = 49)		(n = 49)	
<u>M</u>	74.06	70.33	<u>M</u>	73.51 71.43
<u>SD</u>	12.09	13.02	<u>SD</u>	12.47 13.74
<u>SC</u>	(n = 48)		(n = 48)	
<u>M</u>	1.0035	.9806	<u>M</u>	1.0710 1.0379
<u>SD</u>	.3584	.4125	<u>SD</u>	.4056 .3770
<u>STAI</u>	(n = 49)		(n = 49)	
<u>M</u>	47.69	44.45	<u>M</u>	49.00 46.12
<u>SD</u>	5.17	6.17	<u>SD</u>	5.32 5.92

The following section examines separately each of the four hypotheses of the study by providing the results of the Paired Samples t-tests and the Analysis of Covariance (ANCOVA). Results of both statistical tests are provided on one table for each outcome measure at the end of this chapter.

Lipsey's (1990, p. 28) work on design sensitivity and treatment effectiveness research identifies statistical power as the probability that a statistical test of the null hypothesis upon sample data will (correctly) yield statistical significance when the null hypothesis is, in fact, false for the population from which the sample is drawn. Tables 5, 6, 7, and 8 indicate the major elements of statistical power: the statistical test, the alpha level, and sample size. When the effect size is larger, it is more probable that there is statistical significance and greater statistical power.

Results from this study are compared with the average statistical power reported for detecting small, medium, and large effects in Lipsey's comparative review of statistical power levels used in various research domains. Examining Cohen's power chart for a study with sample size of 49 for each treatment group, the average statistical power reported for detecting effect size (ES) is between .10 and .15. Compared to Lipsey's review of statistical power levels in various research domains (p. 23), the results for ES in Tables 7 (STAI) and 8 (HR) are similar to those in the research domains of education, .13, and medicine, .14, for "small" effects. Table 5 (SC) indicates observed power is well below .10. Results for in Table 6 (MAP) falls between

"medium" effect size and "large" effect size for studies in the research domains of education (.47 to .73) and medicine (.39 to .61). The design was able to pick up small effect size, if it was present.

In a classic description, Walker and Lev (1953) explained the Analysis of Covariance (ANCOVA) as a technique that is applied to testing for a significant difference in treatment effect. The technique takes into account another variable, the covariate, that may have an effect on the outcome variable, independently of treatment. The ANCOVA compares the regression of the outcome variable on the covariate for one of the treatments with the corresponding regression on the other treatment.

In this study the dependent variables are salivary cortisol (SC), mean arterial pressure (MAP), heart rate (HR), and STAI scores. The factors of interest are the treatments, CBAR and CI. The respective treatments were applied to participants randomly placed into either the experimental or comparison groups. Since there was variation in the pretest scores of the participants before CBAR and CI application, the initial or pretest values of the dependent variables are called the covariates. The covariates are used to determine whether CBAR or CI treatments make a difference in posttest scores for SC, MAP, HR, and STAI for participants with equal pretest scores.

In ANCOVA an assumption, homogeneity of regression slopes, is tested. To be able to compare final, posttest means for CBAR and CI without having to condition on a particular value of the covariate, the researcher must be able to assume that the regression of the final posttest

value on the initial pretest value is the same for both treatments. The assumption of equality (homogeneity) of regression slopes can be tested by fitting a model containing the main effects of treatment and pretest scores of the four measures, as well as the interaction of treatment and pretest scores for the dependent variables. This interaction provides the test of the null hypothesis of equal slopes (SPSS, Inc., 1998).

To test between-subjects effects, the F test is used and the significance level indicates whether to reject the null hypothesis in the test for equal slopes. If the interaction shows no evidence of violation of the equal slopes assumption (F values with significance $p > .05$), then the homogeneity of regressions assumptions would not be rejected. Then an estimate of CBAR and CI on posttest measures given the pretest measures, can be completed (SPSS, Inc., 1998, pp. 158-160).

Analysis of Covariance Model. The ANCOVA determines between-subjects effects in a test for equal intercepts. Results are reported by the F test and the level of significance for evidence of treatment effect. The test for the covariate is a test of the common or pooled within-cells regression of posttest scores on prettest scores for the outcome measures. The regression coefficient is a parameter estimate, the B coefficient, that indicates a common slope for the pretest outcome measure. In a General Linear Model parameterization, the intercept parameter estimate provides the estimated value of the last category of treatment, when the covariate is equal to zero. Results are reported by the

t-test and the level of significance for the slope being equal to zero (SPSS, Inc., 1988).

To illustrate ANCOVA, consider an outcome measure's posttest scores as the Y-Axis and the pretest, or covariate, as the X-Axis. On a graph, one regression slope would represent CBAR, while a second regression slope would represent CI. The factors to examine can be placed into the following format of questions: 1) Is there an interaction effect or are the slopes equal (homogeneity of regressions)?, 2) Are there equal intercepts?, and 3) are the slopes = zero? The most significant question is whether the intercepts are equal.

To reiterate the hypotheses noted in Chapter IV:

H 1) CBAR is associated with greater reduction in salivary cortisol(SC) levels than CI for family member treatment in the ER.

H 2) CBAR is associated with greater reduction in mean arterial pressure (MAP) than CI for family member treatment in the ER.

H 3) CBAR is associated with greater reduction in heart rate (HR) than CI for family member treatment in the ER.

H 4) CBAR is associated with greater reduction in the State and Trait Anxiety Inventory (STAI) levels than CI for family member treatment in the ER.

The data are now presented and followed by a summary of the results.

Table 5

Hypothesis Testing for Salivary Cortisol

<u>Paired Samples t-test for Salivary Cortisol</u>						
<u>Treatment</u>		<u>pretest</u>		<u>posttest</u>	<u>t</u>	<u>p-value</u>
Experimental	<u>M</u>	1.0035	<u>M</u>	.9806	-.423	.674
Group(n = 48)	<u>SD</u>	.3584	<u>SD</u>	.4125		
Comparison	<u>M</u>	1.0710	<u>M</u>	1.0379	-.716	.477
Group(n = 48)	<u>SD</u>	.4056	<u>SD</u>	.3770		

<u>Analysis of Covariance for Salivary Cortisol</u>				
			2	
	<u>F</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Intercept	<u>.057</u>	<u>.811</u>	<u>.001</u>	<u>.056</u>
Equal Slopes	.001	.976	.000	.050
			2	
	<u>t</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Slopes = 0	7.198	.000*	.358	1.000

* Statistically significant at $p < .05$

H 1: CBAR is associated with greater reduction in SC levels than CI for family member treatment in the ER.

Paired Samples t-tests for Salivary Cortisol. Table 5 indicated that although SC decreased for both groups from pretest to posttest, the changes were not statistically significant for either the experimental group (p -value = .674) or the comparison group (p -value = .477)

ANCOVA Results. First, testing the assumption of homogeneity of regression slopes: The interaction is key in the test of the null hypothesis of equal slopes. The F = .001 and the significance level = .976; therefore, there is no statistical significance. No evidence of violation of the equal slopes assumption is provided, so the assumption for homogeneity of regressions is not rejected.

Second, results in Table 5 indicate there is little evidence of difference of treatment effect: F = .057 and statistical significance = .811. There was no significant difference in the test for equal intercepts. Further examination is required, but the null hypothesis is supported at this point.

Third, the regression coefficient estimate β = .618, t = 7.198, and significance = .000. The slopes are not equal to zero, as a statistically significant difference exists.

Table 6

Hypothesis Testing for Mean Arterial Pressure

<u>Paired Samples t-test for Mean Arterial Pressure</u>					
<u>Treatment</u>		<u>pretest</u>		<u>posttest</u>	
Experimental	<u>M</u>	109.0816	<u>M</u>	105.2925	-3.158
Group (n = 49)	<u>SD</u>	14.3582	<u>SD</u>	15.8845	
Comparison	<u>M</u>	103.0884	<u>M</u>	103.6122	.453
Group (n = 49)	<u>SD</u>	12.4573	<u>SD</u>	13.1412	.653

*Statistically significant at $p < .05$

<u>Analysis of Covariance for Mean Arterial Pressure</u>				
			2	
	<u>F</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Intercept	4.797	0.031*	.048	.582
Equal Slopes	.583	.447	.006	.118
			2	
	<u>t</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Slopes = 0	14.478	.000*	.688	1.000

*Statistically significant at $p < .05$

H 2: CBAR is associated with greater reduction in MAP than CI for family member treatment in the ER.

Paired Samples t-tests for MAP. Table 6 indicates that MAP for the experimental group decreased from pretest to posttest. The change was statistically significant (p -value = .003). For the control group MAP increased from pretest to posttest, however, this change was not statistically significant (p -value = .653).

ANCOVA Results. First, testing the assumption of homogeneity of regression slopes: The interaction is key in the test of the null hypothesis of equal slopes. The $F = .583$ and the significance level = .447; therefore, there is no statistical significance. No evidence of violation of the equal slopes assumption is provided, so the assumption for homogeneity of regressions is not rejected.

Second, results in Table 6 indicate there is statistical evidence of difference of treatment effect: $F = 4.797$ and statistical significance = .031. There was a significant difference in the test for equal intercepts and the null hypothesis is hence rejected.

Third, the regression coefficient estimate $\beta = .900$, $t = 14.478$, and significance = .000. Due to the statistically significant difference, the slopes do not equal zero.

Table 7

Hypothesis Testing for Heart Rate

<u>Paired Samples t-test for Heart Rate</u>						
<u>Treatment</u>		<u>pretest</u>		<u>posttest</u>	<u>t</u>	<u>p-value</u>
Experimental	<u>M</u>	74.06	<u>M</u>	70.33	-2.732	.009*
Group (n = 49)	<u>SD</u>	12.09	<u>SD</u>	13.02		
Comparison	<u>M</u>	73.51	<u>M</u>	71.43	-1.383	.173
Group (n = 49)	<u>SD</u>	12.47	<u>SD</u>	13.74		

*Statistically significant at $p < .05$

<u>Analysis of Covariance for Heart Rate</u>				
			2	
	<u>F</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Intercept	.605	.439	.006	.120
Equal Slopes	.011	.918	.000	.051
			2	
	<u>t</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Slopes = 0	9.438	.0000*	.484	1.000

*Statistically significant at $p < .05$

H 3: CBAR is associated with greater reduction in HR than CI for family member treatment in the ER.

Paired Samples t-tests for heart rate. Table 7 indicates that HR decreased from pretest to posttest for both groups. The changes were statistically significantly for the experimental group (p -value = .009), but the change was not statistically significant for the control group (p -value = .173).

ANCOVA Results. First, testing the assumption of homogeneity of regression slopes: The interaction is key in the test of the null hypothesis of equal slopes. The F = .011 and the significance level equals .918; therefore, there is no statistical significance. No evidence of violation of the equal slopes assumption is provided, so the assumption for homogeneity of regressions is not rejected.

Second, results in Table 6 indicate there is little evidence of difference of treatment effect: F = .605 and statistical significance equals .439. There was no significant difference in the test for equal intercepts. The null hypothesis is not rejected.

Third, the regression coefficient estimate $\beta = .758$, $t = 9.438$, and significance equals .000. There is a statistically significant difference. There is a slope.

Table 8

Hypothesis Testing for the STAI

<u>Paired Samples t-test for the STAI</u>						
<u>Treatment</u>		<u>pretest</u>		<u>posttest</u>	<u>t</u>	<u>p-value</u>
Experimental	<u>M</u>	47.69		<u>M</u> 44.45	-3.864	.000*
Group(n = 49)	<u>SD</u>	5.17		<u>SD</u> 6.17		
Comparison	<u>M</u>	49.00		<u>M</u> 46.12	-3.811	.000*
Group(n = 49)	<u>SD</u>	5.32		<u>SD</u> 5.92		

*Statistically significant at $p < .05$

<u>Analysis of Covariance for the STAI</u>				
			2	
	<u>F</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Intercept	.713	.401	.007	.133
Equal Slopes	.085	.771	.001	.060
			2	
	<u>t</u>	<u>p-value</u>	<u>eta</u>	<u>Power</u>
Slopes = 0	5.890	.000*	.267	1.000

*Statistically significant at $p < .05$

H 4: CBAR is associated with greater reduction in the STAI scores than CI for family member treatment in the ER.

Paired Samples t-tests for STAI. Table 8 indicated that STAI scores decreased from pretest to posttest for both groups. Also, the changes were statistically significant for both the experimental group (p -value = .000) and the control group (p -value = .000).

ANCOVA Results. First, testing the assumption of homogeneity of regression slopes: Again, interaction is key in the test of the null hypothesis of equal slopes. The $F = .085$ and the significance level = .771; therefore, there is no statistical significance. No evidence of violation of the equal slopes assumption is provided, so the assumption for homogeneity of regressions is not rejected. The slopes are equal.

Second, results in Table 6 indicate there is little evidence of difference of treatment effect: $F = .713$ and statistical significance = .401. No significant difference was noted in the test for equal intercepts, but further consideration is needed. The null hypothesis is supported here.

Third, the regression coefficient estimate $\beta = .596$, $t = .5890$, and significance = .000. There is a statistically significant difference. The slopes are not equal to zero.

Summary

This chapter has focused on the results of the statistical analyses. The descriptive statistics have been reported to address the characteristics of the population studied. Analysis of Covariance was completed for the four major hypotheses. The main test of the Analysis of

Covariance is testing for equal intercepts. For the four major hypotheses, only H 2: CBAR is associated with greater reduction in MAP than CI for family member treatment in the ER, is empirically supported as being differentially better. In this instance the null hypothesis is rejected. Therefore, for the dependent variable, mean arterial pressure, there was a difference in treatment for CBAR and its effect versus CI for family member treatment in the ER. This result and the results of the other statistical analyses will be discussed in further detail in the following chapter.

Chapter VI

Discussion

The purpose of this study was to identify systematically client characteristics, delineate the effectiveness of two major interventions, and differentiate outcomes on physiological and psychological measures for family members of emergency room patients in an Air Force medical center. This study examined relationships between treatment and military status, age, gender, and the family position of the participant to the patient, plus treatment outcomes. It was proposed that practitioners use treatments that take into account a biopsychosocial context that provides attention to the physiological and psychological aspects of a person. This chapter summarizes the major study findings for the individual hypotheses, discusses unique client characteristics that may influence study findings, examines study limitations and measurement issues, provides implications for practice, and presents suggestions for future research.

Principal Findings

The nature of the study provided the flexibility to examine the effectiveness of two interventions on four outcome measures to provide information of use to social work practitioners, and answer some general questions about service provision to family members of critically ill and injured emergency room patients. The data pertained to active duty military personnel and their families and

retired military personnel and their families, and are presumed not to be applicable beyond that population.

Client Characteristics

The study participants, when categorized by military status, are more representative of retired military personnel and their families than the active duty military members and their families. This is reflected in median ages, over fifty-five years old, for both treatment groups. Older age of participants also indicates a trend in the participants' relationships to the patients. The data showed 55 female participants of whom 44 are wives and 43 male participants of whom 35 are husbands. The husband-wife dyad far surpassed any other family relationships represented in the study. Fewer patients were children(8), as indicated by the small number of fathers, mothers, and stepparents.

Specific characteristics of the sample population, military retiree status, age, and relationship to the patient, plus, two factors, the impact of military service and trust for this population, are discussed later in light of the overall study findings.

Current studies do not generally note gender, age, or ethnic characteristics of families who accompany ER patients (Boyack & Bucknum, 1991; Heggar, 1993; Ponto & Berg, 1992). Marital status distribution of ER patients was cited in a study of the impact of ER social work on recidivism, (Keehn et al., 1994); however, no delineation was noted for ER patients' family members. Thus, this study fills a gap in the literature by identifying some characteristics of family members who accompany critically ill or injured patients.

The study focused on family members, yet also examined two aspects of hospital use by the patient who was related to the volunteer: the number of ER visits and hospital admissions two years prior to the study. Both the experimental and comparison group had at least half of its members accompanying the patient to the ER for the first occasion of treatment in two years. Not every ER visit led to a hospitalization, as a small number of patients had a change in status, namely, an accidental poisoning of a toddler and a cancer patient receiving chemotherapy whose fever remitted. The successive categories for ER visits do not indicate whether the same family member-volunteer accompanied the patient. Both the experimental and comparison group had more than half of its members admitted to the hospital at least once in the past two years. The number of hospital admissions does not indicate whether the same volunteer accompanied a patient for each hospitalization in the medical center. Later, hospital admission and ER visitation are discussed in light of the particular characteristics of the retired population.

Recent studies have examined hospital admissions 1) in relation to cost containment and assess time-limited, problem-specific issues (Ponto & Berg, 1992), and 2) for reducing non-acute admissions and assessing family and community networks to reduce social admissions (Boyack & Bucknum, 1991). The present study addressed ER visits and admissions, solely as indicators of previous exposure to medically-related stress. Thereby, this study moves away from the managerial and administrative study trend in the literature toward effective treatment outcomes for families.

The data analysis revealed that the two groups were homogeneous. However, neither the homogeneous composition nor the descriptive trends can be assumed to occur at any other military medical center, hospital, or clinic.

Interventions

Two interventions compared in this study were CI and CBAR. The results of the research lend support to the effectiveness of the treatments in reducing physiological stress associated with critically ill or injured patients to the ER for family members/significant others. A large sample size ($N = 98$) was used to increase the effect size of the design and to detect changes in CBAR techniques and standard social work intervention on the dependent variables. Both CBAR and CI techniques are helpful intervention methods. CBAR is somewhat more helpful on most of the outcome measures as indicated by the previously given statistics.

One citation in the literature noted in a major trauma center that 24% ($n = 418$) of social work activity was listed as family support and 12% ($n = 209$) as CI (Keehn et al., 1994); however, outcome studies on family support and CI effectiveness were not available. The present study showed the effectiveness of the standard social work intervention and provided a new method of intervention for practitioners helping family members of ER patients.

Outcome Measures

The outcome measures for the study included salivary cortisol, mean arterial pressure, heart rate and the State and Trait Anxiety Inventory. The following sections present the individual hypotheses, the outcome measures, and discussion related to findings in the literature. Discussed

are some considerations regarding the outcome measures on the whole, as related to the concept of stress presented in the conceptual framework, and in relation to the particular characteristics of the sample population studied.

The First Hypothesis

CBAR's associated with greater reduction in salivary cortisol(SC) levels than CI for family member treatment in the ER, was not supported by the results of the ANCOVA. The expectation was that the conditions of the patients in the ER could evoke strong emotions for family members, which would cause consistent and heightened salivary cortisol secretion; therefore, following intervention, a consistent and reduced cortisol secretion would occur. In this study, the pretest and posttest ranges for salivary cortisol fell both above and below the established research reference ranges for salivary cortisol (.63 and 1.23 ug/dl). Ranges were determined in a research protocol to establish normal values in the Clinical Research Laboratory, Keesler Medical Center (Farhni, 1998).

In this study, T-tests indicated a reduction in salivary cortisol for CBAR and CI pretest and posttest means, but no statistically significant differences were found ($t = -.423$, $p\text{-value} = .674$). The more sensitive ANCOVA indicated no treatment effect was evident for salivary cortisol ($F = .001$, $p\text{-value} = .976$).

Several points of consideration include the following: 1) not all persons may be affected by the critical illnesses or injuries of family members, and 2) salivary cortisol levels may take a longer time to return to a normal level than realized. The following are results of early Behavioral

studies that used in vivo techniques to stimulate anxiety, desensitization, and plasma cortisol measurement. The authors found cortisol not to be a reliable measurement technique due to variability (Curtis et al., 1976; Curtis et al., 1978; Neese et al., 1985).

An early study, without randomized assignment of clients to in vivo flooding conditions, used plasma cortisol as a measure of phobic anxiety (Curtis et al., 1978). Results indicated, "an individually variable, and on the whole, unimpressive association between plasma cortisol and strong anxiety" (p. 374). The authors surmised that anxiety and stress accounted for less variation in plasma cortisol levels than a powerful emotional stimulus would have been expected to produce. As the results of this study were supported by similar findings on the same phenomenon (Curtis et al., 1976), the authors suggested re-evaluation of the hypothesis that affective arousal is the chief psychological cause of adrenal cortical function.

Neese et al. (1985) studied in-vivo exposure therapy, using salivary cortisol as one of twelve-outcome measures for the six randomly assigned subjects ($F = 21.30$, $p < 0.0001$, eta squared = 0.056). The authors found the magnitude, consistency, timing, and concordance of endocrine and cardiovascular responses showed considerable variation and concluded that, "The body may well respond differently to stress that is chronic or induced by other emotions or situations . . . the stress response is not a simple on-off phenomenon" (p. 329).

In a study of endocrine responses to stress in the laboratory (Lundberg et al., 1990), Swedish researchers

found in pairwise comparisons of laboratory-induced-stress between four study groups that the female managers ($n = 29$) had significantly higher values ($T = 2.78$, $p < 0.01$) than their male colleagues ($n = 29$). The urinary cortisol excretion rates ($F = 31.7$, $p < 0.0001$) were significantly higher during laboratory-induced stress compared to rest ($p = 0.0001$). The authors noted that due to the normal diurnal rhythm cortisol, the difference values show an overestimation of cortisol reactivity. The authors considered the consistency of reactivity values (the extent the magnitude of change in physiological arousal from baseline to stress is stable over conditions and time), and determined their neuroendocrine data showed low consistency between reactivity in laboratory and naturalistic settings. Further study was suggested for testing laboratory findings in real life studies.

Field, Henteloff, Hernandez-Reif, Martinez, Mavunda, Kuhn, and Schanberg (1998) studied pulmonary functions after massage therapy for 32 children with asthma, randomly assigned to relaxation or massage therapy. Salivary cortisol was an index of stress reduction. Based on a power analysis (for a medium effect at power = 0.80 and $p < 0.05$), 32 children were recruited from a pediatric pulmonary clinic. None of the children had experienced emergency admissions to the hospital, 79% had at least one hospitalization in the year preceding the study, and 21% had two hospitalizations during the same period. The children were Hispanic, Black, and white-non Hispanic. The children's salivary cortisol levels decreased significantly on both the first and last days after massage, but not after relaxation therapy.

In summation, the results of the present study do not support the first hypothesis; however, it is a replication without inducing stress and took place in a real life setting. Continued testing using salivary cortisol as one of several outcome measures is not recommended with adult populations.

The Second Hypothesis

CBAR's association with greater reduction in mean arterial pressure (MAP) than CI for family member treatment in the ER, was supported by the results of the ANCOVA. My expectation was that the conditions of the patients in the ER could evoke strong emotions for family members, which would cause consistent and heightened mean arterial pressure; therefore, after treatment, a consistent and reduced mean arterial pressure would occur. T-tests indicated a statistically significant reduction in mean arterial pressure in CBAR and CI pretest and posttest means ($t = -3.158$, $p < .003$). The more sensitive ANCOVA indicated a treatment effect for CBAR and mean arterial pressure ($F = 4.797$, $p < 0.031$).

Curtis and Detert (1981) compared blood pressure as an outcome measure for five methods of eliciting total body relaxation. Blood pressure decreased for Benson's method, transcendental meditation, and Zen and yoga; however, inconclusive results were noted for progressive relaxation and hypnosis with suggested relaxation (p. 51).

Chavez and Faber (1987) examined the effect of an education program on 40 family members visiting their significant other in the Intensive Care Unit of a Veterans Administration Medical Center. Mean blood pressure (mm Hg) was

used as an outcome measure, pretest and posttest, for the randomized, two-group experimental design. In the experimental group, mean blood pressure went down slightly after exposure to treatment ($t = -1.20$, p -value 0.245), but after the participant's bedside visit to the patient, mean blood pressure rose higher than the pretest measurement ($t = 1.55$, p -value 0.137).

In summation, the empirical results of the present study support the second hypothesis. The study occurred without inducing stress and took place in a real life setting. Continued testing and the use of CBAR using mean arterial pressure as an outcome measure is recommended with adult populations.

The Third Hypothesis

CBAR's association with greater reduction in heart rate (HR) than CI for family member treatment in the ER, was not supported by the results of the ANCOVA. My expectation was that the conditions of the patients in the ER could evoke strong emotions for family members, which would cause consistent and heightened heart rates; therefore, following intervention a consistent and reduced heart rate would occur. T-tests indicated a reduction in CBAR and CI pretest and posttest means, but no statistically significant differences. The more sensitive ANCOVA indicated no treatment effect was evident for heart rate.

Heart rate was taken electronically, but when the technician was unable to obtain a heart rate by machine, a manual heart rate reading was taken. Over 20 different medical technicians took heart rates either pretest or

posttest. Therefore, heart rate results for this study may be influenced by error.

Heart rate has been an effective outcome measure for stress and anxiety in several other studies. Chavez and Faber (1987) examined the effect of an education program on 40 family members visiting their significant other in the Intensive Care Unit of a Veterans Administration Medical Center. Mean heart rate (beats/minute) used as an outcome measure for the pretest and posttest, randomized, two-group experimental design. In the experimental group, heart rate decreased after exposure to treatment ($t = -2.65$, $p\text{-value} = 0.016$) and further decreased after a bedside visit to the patient ($t = -2.73$, $p\text{-value} = 0.013$).

Kaplan et al. (1982) used heart rate as a measure of emotional arousal for the study on stressful sigmoidoscopy. Patients were randomly assigned to a cognitive modeling group and a relaxation group. Average heart rate (beats/minute) for each of the cognitive modeling groups were internal-personal (77.14), external-doctor (85.80), and attention-control (77.39). Participants in the external-doctor control group had average heart rates during the exam which were 8 beats per minute faster than those of participants in the other groups [$F(1,60) = 3.76$, $p < 0.0060$]. Average heart rate (beats/minute) reported for the relaxation group and no relaxation group were 80.48 and 79.55, respectively.

In summation, the results of the present study do not support the third hypothesis; however, there may have been limitations imposed by the data collection process. Continued testing using heart rates as an outcome measure is

recommended with adult populations, because of its success in other studies.

The Fourth Hypothesis

CBAR's association with greater reduction in STAI scores than CI for family member treatment in the ER, was not supported by the results of the ANCOVA. My expectation was that the conditions of the patients in the ER could evoke strong emotions for family members, which would cause consistent and heightened STAI scores; therefore, following intervention a consistent and reduced STAI score would occur.

T-tests indicated a reduction in STAI scores for CBAR and CI pretest and posttest means, and statistically significant differences, $t = -3.864$, $p\text{-value} .000$, and $t = -3.811$, $p\text{-value} .000$, respectively. The more sensitive ANCOVA indicated no treatment effect was evident for STAI scores ($F = .713$, $p\text{-value} .401$).

During the course of the study new information was learned that identified the use of the STAI-X as a less appropriate measure for anxiety than the newer version, STAI-Y. Spielberger and Sydeman (1994) reported several advancements in the development of the State and Trait Anxiety Inventory - X. In 1983 the instrument was revised STAI (Form Y) and those items with depressive content having weaker psychometric properties were eliminated. High correlations, ranging from .73 to .85, were noted on STAI-X Anxiety Scale and the Anxiety Scale Questionnaire (Cattell & Scheier, 1963) and the Manifest Anxiety Scale (Taylor, 1953). Thus, a high degree of concurrent validity was indicated. This scale provides less contamination with

depression and anger (Spielberger & Sydeman, 1994, pp. 298-299). Spielberger, Ritterband, Sydeman, Reheiser, and Unger (1995) highlight the importance of measuring and reporting to patients their psychological vital signs in order to facilitate effective crisis intervention and treatment, thus linking intense feelings to the events and experiences that influence feelings.

In summation, the present study was conducted using the STAI-X. Results indicate no treatment effect was noted for psychological anxiety. The instrument could also be measuring depression and anger. This presents a limitation to the research study. STAI-Y should be used in the future.

Summation of the Outcome Measure Results

To reiterate, mean arterial pressure was the only outcome measure that showed a differential treatment effect for the application of CBAR and CI in this study. The use of salivary cortisol as an outcome measure for adults continued to show variability, that has been remarked upon by other studies. Heart rate as an outcome measure did not perform as well as was noted in other studies. The STAI scores did not indicate a change in anxiety for participants in either treatment group.

An Alternative Explanation

The four hypotheses have been examined in light of the findings from the past literature; however, little explanation was found regarding why the treatment interventions might or might not have worked. The following section examines the concept of stress in light of the context of the military organization and military culture that may influence the characteristics of the sample

population. Stress was defined as "a function of the interaction of the subjectively defined demands of a situation and the capacity of an individual to respond to these demands. Stress exists when the subjectively experienced demands are inconsistent with response capabilities" (Straus & Kantor, 1993, p. 46). Retired military personnel and their families may very well perceive an ER visit accompanying a critically ill or injured family member in a different manner than younger persons or older civilians. The context of the military organization and the military culture may influence the subjectively experienced demands and response capabilities of the retiree and the military family member. Thus, measurement outcomes could be different for this population.

Herbert Benson (1996), Director of the Behavioral Medicine Program at Harvard University, coined a phrase, "remembered wellness." In brief, remembered wellness was the patient's own ability to heal that also incorporated trust in the healer. Benson postulates that remembered wellness is an integral, but little remembered or appreciated part of Western medical care. Remembered wellness may be an important factor in military medical care which attenuates high levels of stress. Trust in the military system will be examined in relation to remembered wellness.

Could there be something about a retiree's past military training or the experience of being a military spouse that increases a person's coping skills, adaptability, or ability to identify or call on sources of strength, that could thereby mitigate the stress response?

Do early military training for personal preparedness or disciplined emotional responses to potentially life threatening situations have a lasting effect? Are these evident when responding to family member's critical injuries and illnesses in the ER?

The Role of Medical Care in Military Life

Medical care plays an integral part in military life. A special relationship of trust exists between the military member and the medic, based on the medic's lifesaving capabilities during combat (Keegan, 1976; Zajtchuk & Sullivan, 1995). Basic combat medical concepts of first aid, buddy care, and triage are taught to all military members. "GI Dog Tags" and military identification cards note blood type. Medical examinations determine fitness for duty. Immunizations and urinalysis are required. Medical records are used to determine veterans benefits upon retirement. Multiple military facilities and air evacuations may be used in the course of a military career. This special trust of medical personnel can be extended into retirement.

The Role of Trust

Retirees may be more trusting of military medical care than of civilian medical treatment. Trust would have been built in the military system over a twenty year period by the retiree, through familiarity with clinic routines, waiting room and treatment room atmosphere, expected behaviors of the medical providers, and accountability for errors. Deference to authority or the rank of a medical provider could be associated with greater placebo effects.

Retired military personnel may experience more comfort with medical care in a system they have worked for, may

perceive greater entitlement to services, and may feel increased security with medical providers with whom more common life experiences are shared. Military medical care recipients may have different views of medical care than typical health maintenance organization recipients. If a military patient changes medical providers, the provider is still a military member, not an unknown commodity. Military retirees will have traveled widely and will have had cultural experiences in varied geographic regions of the U.S. or in overseas environments. No matter where the locale, a military member would have standardization in medical care and would have future expectations for that standardization. Family members have become used to military medical care with child birth in hospitals, continued pediatric care, and the family practice orientation of military facilities.

Expressed Anger as an Issue of Trust

Retirees who participated in the study expressed anger with the changes in entitlement for military medical care. Many reported being told that lifetime medical care was a promise of their military enlistment. Often the issue was not only a rejection from entitlements, but also, a perceived rejection from an organization that provided many defining life experiences.

Characteristics of the Sample Population

It is thus hypothesized that the military retiree population may have characteristics, gained in the aging process or by exposure to military training and lifestyle, that would predispose them to interpret and respond to an ER visit with a critically ill or injured family member in a

manner that might not be identified as physiologically or psychologically stressful. Such an ER visit might not equate as a life crisis for a retired military member or family member. Examined now are the following sample population characteristics: 1) older persons, couples and parents, 2) military retirees, and 3) familiarity with the structured environment of the military system. Familiarity with characteristics of the hospital setting and roles are discussed.

Characteristics of Older persons. Older participants have more life experiences that allow a person to place current events into a lifetime perspective. Greater exposure to death and chronic illnesses could have occurred for older persons, as more family members and peers of older persons would have expired. Older Americans are more likely to have lived through World War II, the Korean Conflict, and Viet Nam, thereby enduring more separations from family members. Older persons who lived during the Great Depression are more likely to have endured financial hardships and sacrifices. Older persons have memories of medical care that do not include current advanced technologies. Such breadth of experience can temper responses to presenting situations.

Characteristics of Couples. Couples may manage health stressors in the ER environment differently than parents. In this study patients who were well enough to talk were asked for agreement with the researcher talking to their family members about study involvement. Older couples expressed appreciation for attention to their spouses' emotional needs and concerns. Couples did not mind separation from spouses, particularly when the physicians

and nurses had easy access to the family member. Older persons were interested in having their blood pressure and heart rate measured and knowing the results.

Characteristics of Parents. Couples who accompanied children to the ER would identify for the researcher the parent who could possibly benefit from stress reduction more. However, a parent was only likely to be study participant when the spouse was available to remain with their child. Also, in general young study participants were somewhat surprised if their blood pressures or heart rates were elevated.

Characteristics of Military Retirement. By virtue of a military retirement, the assumption of a more stable lifestyle can be made in that a military pension provides for a source of financial security; military retirement at a younger age allows for a second career; social networks are available for military personnel; and, burial benefits with a military funeral service are available for retired veterans. These same assumptions cannot be made for many other older Americans.

Understanding of Work Roles in the Military ER. In the military every one has specific roles for functioning in a unit and to help achieve the units overall goals. This may be a piece of transferrable knowledge for recipients of medical care. It may be easier to understand the flow of activity in an ER as being related to a patient care mission. Family members may have decreased anxiety knowing the coordinated activity is focused on patient care.

The Context of the Hospital in the Larger Military Environment. In some respects hospital admission after ER

treatment may not represent problems for family members. The family could anticipate trust in the standardization and quality of medical care with minimal financial encumbrances for a patient's admission. The family member's personal situation during patient treatment would probably not create hardship. Lodging, dining, banking, shopping, car repair, and recreation facilities are generally available. In all continued familiarity with the military environment would promote stability.

Summation. A discussion of the unique characteristics of older, retired military persons has been provided. Increased trust in the military medical facility as a factor mitigating a stress response has been explained. In light of these considerations, it is easier to understand why this group might not consider accompanying a critically ill or injured family member to an ER as a life crisis situation and why the physiological and psychological outcome measurements might not be affected. Awareness on the part of military social workers regarding the differences in this population, namely, compliance, security and trust in the medical system, expectations for standardization and quality care, may provide a different social work function for these persons. Replication of this study at a civilian facility might provide a contrast and greater insight for an older population.

Limitations Addressed from the Pilot Study

Previously identified limitations from the pilot study have now been addressed. First, biological differences in gender and age regarding base levels of salivary cortisol were noted. Second, concerns with selection bias,

information about those persons who declined to participate in the study was examined (e.g., types of emergency, age, race, ethnicity, or gender). This was informally catalogued during the course of data collection and was reported in an earlier section. This profile aides in the generalizeability of the study, particularly to the part of the population who agreed to access services. Third, criteria for when to abort the study was established and proved useful. It was proposed that the study would cease and appropriate referrals would be made when the following situations occurred: 1) a patient death, 2) recognition of the participant being under the influence of drugs or alcohol, 3) awareness of a participant's involvement in family violence, and 4) a volunteer who exhibited psychosis, mania, dissociation or other mental health issues. Two individuals who volunteered were determined to be either inebriated or mentally unstable. The sample size of the study was increased to be large enough to determine the effect of treatment via appropriate effect size.

Limitations of the Study

A major set of limitations for this study is common to most field-based clinical research endeavors: some self-selection bias and small cell sizes for some analyses. The sample size appears less varied or diverse than other studies on emergency room social work (Keehn et al., 1994; Parad & Houston, 1984). Generalizability is limited to the Air Force medical centers.

Despite limitations, some positive remarks can be make about the study design. External validity is strengthened since the study takes place in a natural setting. Internal

validity is aided by the group design. Testing, maturation, instrumentation, selection, mortality, statistical regression, and history do not affect the internal validity of this study design (Campbell & Stanley, 1963). The same measures were used for the pretest and posttest. The Analysis of Covariance was conducted with pretest scores as the covariate. The ANCOVA is usually preferable to simple gain-score comparisons and provides a more precise analysis (Campbell & Stanley, 1963).

Measurement Issues

Standardized psychological instruments were as their statistical and psychometric properties have been researched and they are norm referenced for interpretation of a specific population (Jordan & Franklin, 1995). The use of an advanced form of the STAI-Y to eliminate anger and depression and focus on the psychological measurement of anxiety, without contamination by elements of anger and depression, would have been preferable.

In the future another psychological assessment tool and the advanced form of the STAI would be used. Also, a second assessment tool for identifying multiple types of psychosocial and environmental stressors that could be impacting patients would be added, such as, Family Inventory of Life Events (McCubbin, Patterson, & Wilson, 1981). If another study was undertaken, an assessment tool designed specifically for assessing stressors of later life would be included.

Difficulties with the heart rate monitor caused concerns with reliable instrumentation for measuring heart rate. This was done either by hand or machine and by

numerous technicians and may have caused a measurement problem. In the future a research protocol would request specifically a monitor dedicated solely for the research study and not for use in other patient care activities.

One researcher collected the data for this study, so there is a high level of control and reduction of sources of error as opposed to numerous clinicians collecting data. However, other blind spots could be present and unknown.

Strengths and Weaknesses

In light of the findings from previous research, this study suggests several implications for practice. A strength of the research study may be the addition of Applied Relaxation to Cognitive-Behavioral techniques for the reduction of stress. A technique to alleviate physical symptoms of stress was at least helpful in one of the three physiological measures.

Overall, the findings have implications also for the standard social work intervention. It was not harmful and only slightly less effective as the experimental treatment. This study provided some new information for practitioners on CI. An alternative form of intervention that has some usefulness for mediating cardiovascular stress has been identified.

The findings have implications for prevention efforts also. Prevention efforts should provide on-going training to Air Force personnel in medical centers on CBAR, when a choice is available. No extra cost is foreseen for its application.

In conclusion, medically-related stress is a significant social problem that affects many families.

Having two useful treatment methods expands the social work practitioner's tools for dealing with this issue. The present study examined client characteristics, delineated the effectiveness of two interventions, and differentiated outcomes on physiological and psychological measures for family members of emergency room patients. Unique characteristics of the sample population that could have mitigated the stress response were discussed. It is hoped that this study will provide a foundation for further investigation into the effectiveness of CBAR and CI with civilian and military populations in other conditions. It is also hoped that replication of this study with other populations using these improved forms of the outcome measures can be accomplished. By understanding the ingredients for effective treatments and the appropriate outcome measures, practitioners can successfully help family members with medically-related stress and measure their results also.

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